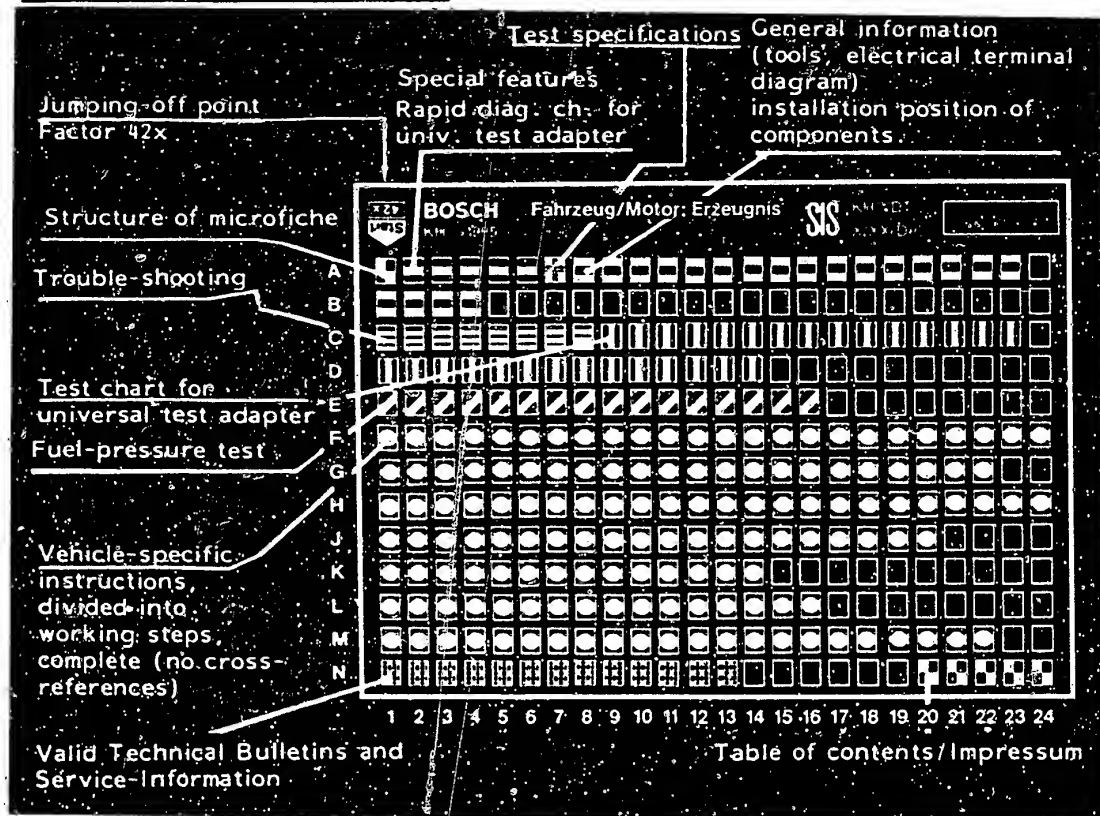


Structure of microfiche



1. Read from left to right
2. Title of microfiche (appears on each coordinate)

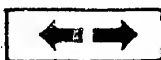
| | |
|------------|-----------------------------|
| E16 | Product/component/test step |
| | Vehicle/engine |

Coordinate

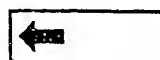
3. Limits of section



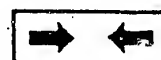
Beginning



Mid-section



End



One-page section

4. Purely vehicle-specific passages in the text are marked with a vertical bar.

5. Reference to relevant working steps in the test specifications, e.g. coordinate C6.

C6

| | | |
|-----------|--------------------------|--|
| A1 | Trouble-shooting program | |
|-----------|--------------------------|--|

SPECIAL FEATURES

- Cold-start control (eliminating of start valve/thermo-time switch)
- Adaptive overrun cutoff
- O-ring connections of injection valves
- Electric fuel pump as in-tank pump and fuel filter in fuel tank
- Choke lever instead of auxiliary-air device
- Double temperature sensor II (engine) for Jetronic and engine fan
- Throttle valve adjustment by measuring pressure drop across the individual throttle valves
- TD triggering of LE2 control unit
- US version included (altitude compensation).
If vehicles are operated at altitudes above 1200 m, the altitude compensation must be connected (5% leaning) in order to comply with the emission limits.

RAPID DIAGNOSIS CHART FOR UNIVERSAL TEST ADAPTER

The following rapid diagnosis chart makes it possible for the experienced L-Jetronic expert to quickly check the electrical part of the system with the universal test adapter.

The rapid diagnosis chart contains the following information:

- sequence of test steps
- settings of V and Ω program switches
- notes on how to operate the universal test adapter or other components
- test specifications for motortester and multimeter
- reference to coordinates of the respective detailed testing and trouble-shooting program.

If detailed instructions and information are required, always proceed according to the trouble-shooting charts starting on Coordinates B1/B2.



Rapid Diagnosis Chart for Universal Test Adapter

| Test Step | Switch Setting | | Measurement | Remarks | Test Specifications (Reading) | For trouble-shooting see Coordinates |
|-----------|----------------|----------|---|-------------------------------|---|--------------------------------------|
| | V | Ω | | | | |
| 1 | 5 | - | Signal from term. TD. <u>Caution:</u> Measurement of resistance in red (+) and black (-) test sockets (correct polarity of measuring equipment important) This test setup applies only to test step 1. Measurement 1: at rest Measurement 2: ignition "ON" and start. On control-unit plug between term. 1 and term. 5 | Shift gear to neutral, start. | Change of resistance between measurements 1 and 2 | C 11 |
| 2 | 6 | - | Voltage from control relay term. 87 On control-unit plug between term. 9 and term. 5 | Shift gear to neutral, start. | 8 ... 15 V | C 15 |
| 3 | 7 | - | Voltage from starting motor term. 50 On control-unit plug between term. 4 and term. 5 | Shift gear to neutral, start. | 5 ... 10 V | C 17 |
| 4 | 8 | - | Jumper for altitude compensation (on US version only) On control-unit plug between term. 11 and term. 5 | Shift gear to neutral, start. | 8 ... 10 V | C 19 |

A3

Rapid Diagnosis Chart

BMW Motorcycle K 100










A4

Rapid Diagnosis Chart

BMW Motorcycle K 100



Rapid Diagnosis Chart for Universal Test Adapter

| Test Step | Switch Setting | | Measurement | Remarks | Test Specifications (Reading) | For trouble-shooting See Coordinates |
|-----------|---|----------|---|---|--|---|
| | V | Ω | | | | |
| 5 |  | 11 | Resistance among other things of temperature sensor NTC I On control-unit plug between term. 8 and term. 5 | Jumper on injection relay between term. 87 and term. 87b 1) Reading without jumper | $100...200 \Omega$ 1) $340...450 \Omega$ | C 21 |
| 6 |  | 12 | Resistance of air-flow sensor potentiometer. On control-unit plug between term. 7 and term. 5 | Deflect air-flow sensor flap as far as it will go | $60...1000 \Omega$ | D 1 |
| 7 |  | 13 | Resistance of temperature sensor NTC II (engine temperature) On control-unit plug between term. 10 and term. 5 | ---- | (+15°C...+30°C): $1.45...3.3 \text{ k}\Omega$ +80°C: $280...360 \Omega$ | D 3 |
| 8 |  | 14 | Resistance of output stage ground On control-unit plug between term. 13 and term. 5 | ---- | $0...10 \Omega$ | D 5 |
| 9 |  | 16 | Resistance of idle contact in throttle-valve switch On control-unit plug between term. 2 and term. 9 | Throttle grip in rest position | $0...10 \Omega$ | D 7 |
| 10 |  | 17 | Resistance of full-load contact in throttle-valve switch On control-unit plug between term. 3 and term. 9 | Throttle grip in full-load position | $0...10 \Omega$ | D 10 |
| 11 |  | 18 | Resistance of all 4 parallel-connected injection valves. On control-unit plug between term. 12 and term. 9 1) for injection valves ... 210 2) for injection valves ... 705 | ---- | 1) +15°C...+30°C: $7.0...9.5 \Omega$ +80°C: $7.2...10.0 \Omega$ 2) +15°C...+30°C: $6.80...9.30 \Omega$ +80°C: $7.00...9.80 \Omega$ | D 12 |

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Rapid Diagnosis Chart
BMW Motorcycle K 100


A6

Rapid Diagnosis Chart
BMW Motorcycle K 100



TEST SPECIFICATIONS

Pressure Regulator

- fuel pressure 2.3...2.7 bar

Electric Fuel Pump

- fuel delivery (measured in return): min. 600 cm³/30s
- terminal voltage (under load): min. 12 V

Temperature Sensor II (engine)

- electrical internal resistance at ambient temperature (+15°C...+50°C): 1.45...3.3 k Ω
- with engine at op. temp. (approx. +80°C): 280...360 Ω

Solenoid-operated Injection Valve (at +20°C)

- electrical internal resistance
- injection valve no. .. 210 15.0...17.5 Ω
- injection valve no. .. 705 14.5...17.0 Ω

Air-flow Sensor

- resistance between
- term. 8 and term. 5: 340...450 Ω
- term. 7 and term. 5 (sensor flap fully deflected) 60...1000 Ω
- term. 9 and term. 5: 500...760 Ω
- term. 8 and term. 9: 160...300 Ω

Idle adjustment (engine at normal operating temperature approx. +80°C)

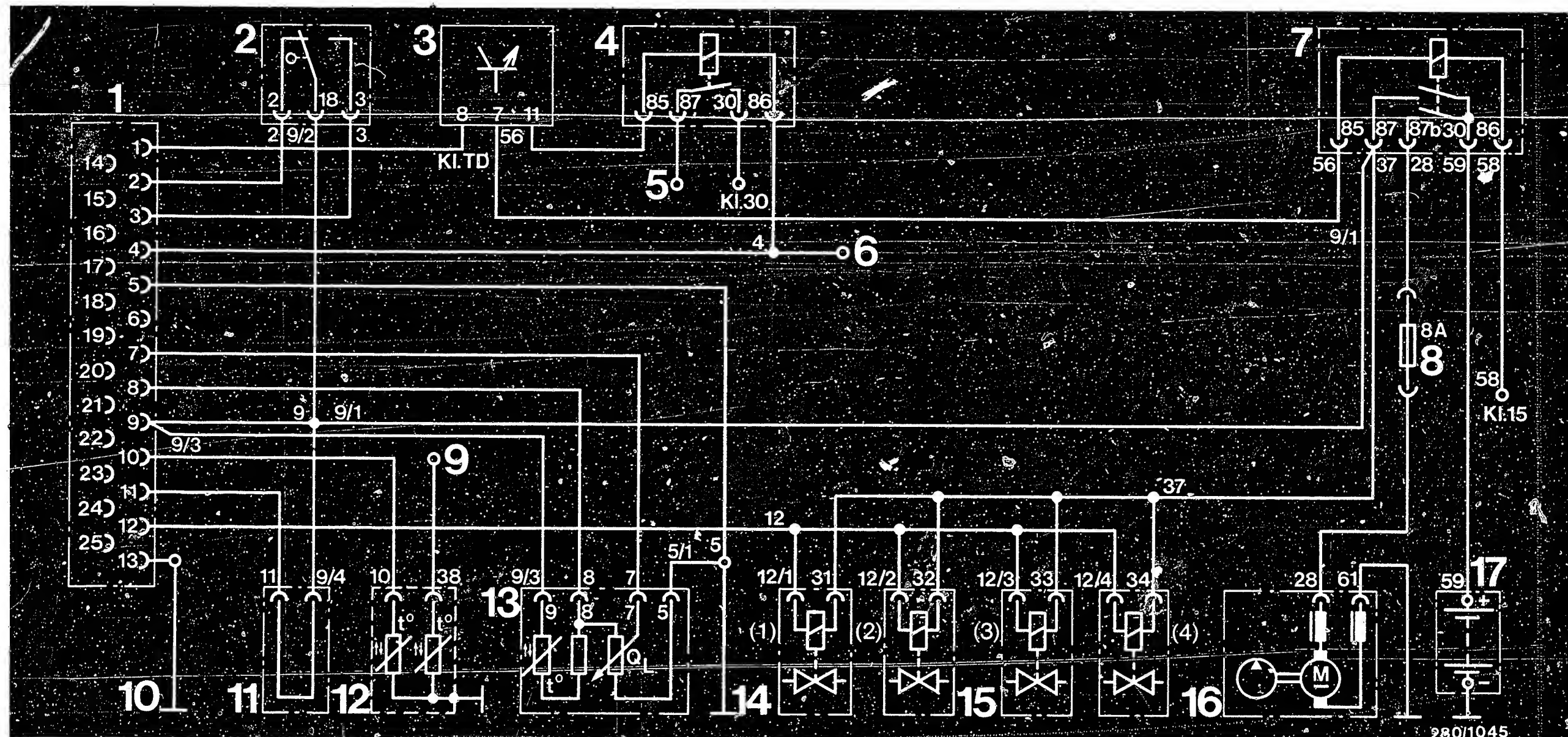
Idle Speed: 900...1000 min⁻¹

CO Setting: 1.5...2.5 Vol%CO

Switch off exhaust system while measuring and adjusting the exhaust.

See equipment and Autodata microfiches for settings for ignition, valve clearance and other engine data.





ELECTRICAL TERMINAL DIAGRAM

- 1 = control-unit plug
- 2 = throttle-valve switch
- 3 = timing advance unit
- 4 = starting-interlock relay
- 5 = to starting motor
- 6 = to starting switch
- 7 = injection relay

- 8 = pump fuse no. 6
- 9 = to temp. control unit
- 10 = central ground terminal
- 11 = jumper for altitude compensation
(US version only)
- 12 = double temperature sensor
(1 x engine temperature - Jetronic
1 x engine temperature - fan)

- 13 = air-flow sensor
- 14 = central ground terminal
- 15 = injection valves
- 16 = electric fuel pump
(in-tank pump)
- 17 = battery

A8

Electrical Terminal Diagram
BMW Motorcycle K 100



A9

Electrical Terminal Diagram
BMW Motorcycle K 100



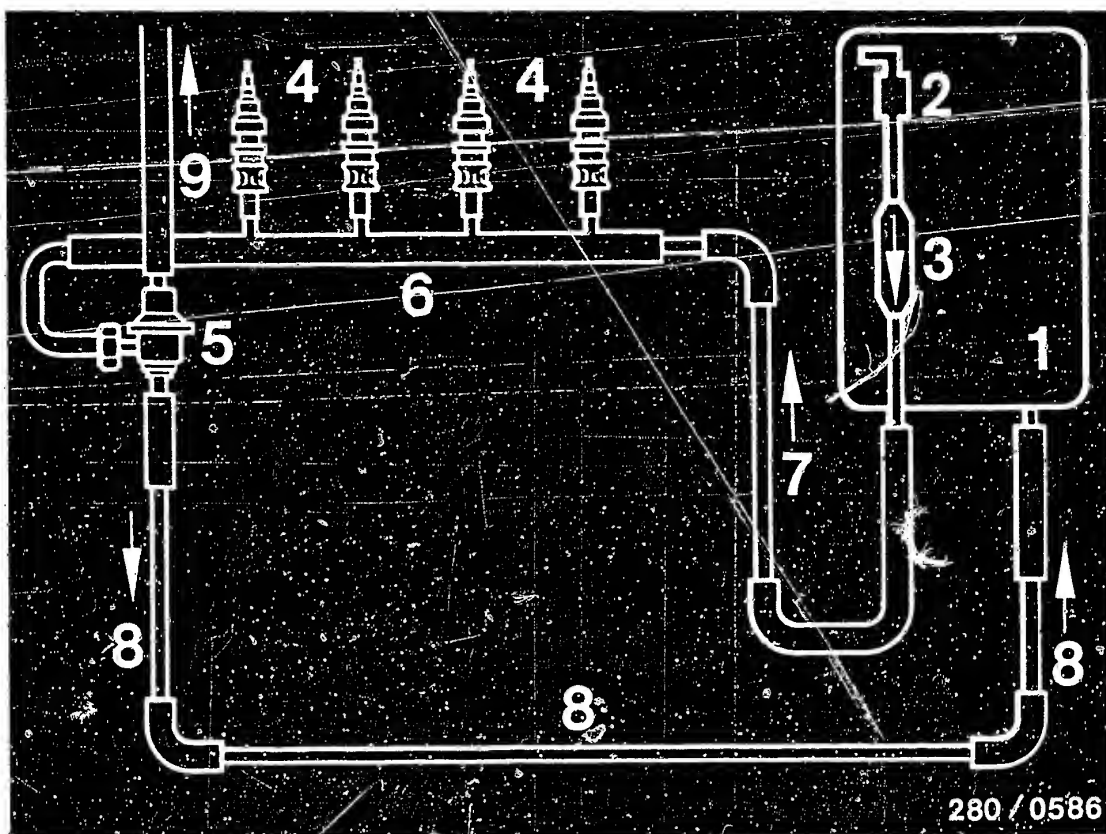


DIAGRAM OF FUEL LINES

- 1 = fuel tank
- 2 = in-tank fuel pump
- 3 = fuel filter
- 4 = solenoid-operated injection valves
- 5 = pressure regulator
- 6 = fuel-distribution pipe
- 7 = fuel delivery line
- 8 = fuel return line
- 9 = to intake manifold

TEST EQUIPMENT AND TOOLS

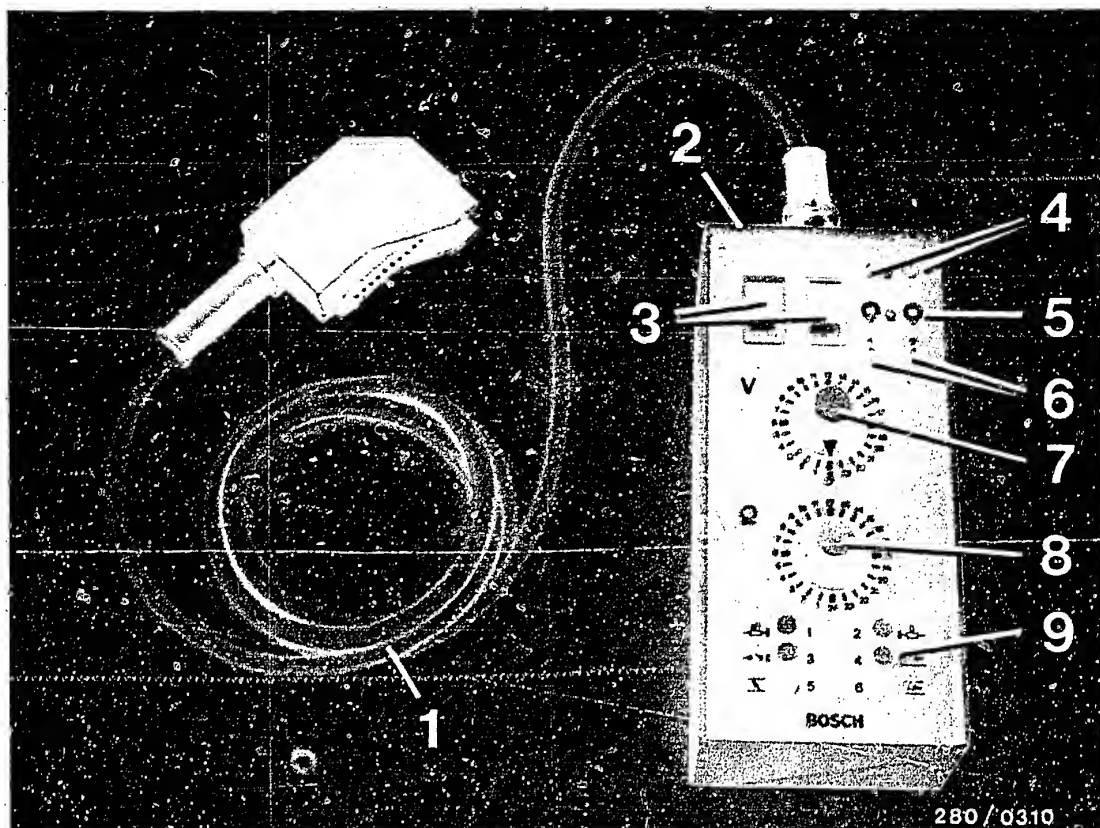
| <u>Description</u> | <u>Designation</u> | <u>Part No.</u> |
|---|---|---|
| universal test adapter | ETT 018.01 | 0 684 101 801 |
| adapter lead | | 1 684 463 123 |
| motortester | e.g. MOT 002.000 MOT 300 MOT 400 | 0 684 000 200 0 684 000 300 0 684 000 400 |
| exhaust-gas analyzer calibrated | e.g. ETT 008.04 | 0 684 100 804 |
| exhaust-gas analyzer uncalibrated | e.g. ETT 008.00 | 0 684 100 800 |
| test lead | | 1 684 463 093 |
| ignition timing light | ETZ 005.00 | 0 684 100 500 |
| electrics tester or multimeter | e.g. ETE 014.00 e.g. Philips PM 2517 X e.g. Miselco Master 50 K e.g. Fluke Multimeter 75 | 0 684 101 400 |
| vacuum tester | e.g. ETT 007.00 | 0 684 100 700 |
| tester for delivered quantity comparison | | KDJE-P 200 |
| solenoid-operated injection valve as of 6.84 | | 0 280 150 210 0 280 150 705 |



| <u>Description</u> | <u>Designation</u> | <u>Part No.</u> |
|--------------------------------------|--|-----------------|
| silicone grease for injection valves | FT 2 v 1 | 5 700 080 125 |
| pressure gauge | quality class 1.0 = 6 bar 0.1 bar graduation | 1 687 231 154 |
| three-way line | | KDJE-P 100/13 |
| pressure tester | * | KDJE-P 100 |
| parts set | | 1 287 010 704 |
| hexagon-socket-screw key | | A/F 5 |

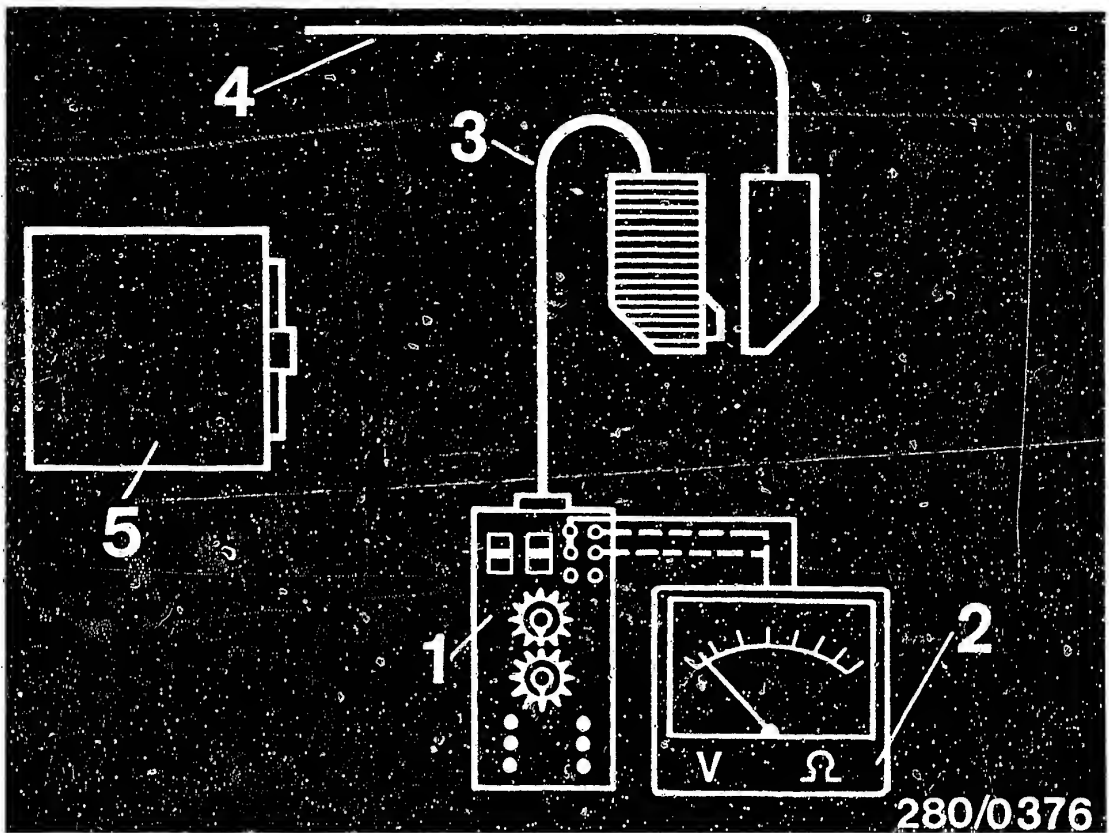
Use suitable commercially available tools for fitting and removing the idle CO anti-tamper device on the air-flow sensor.





Universal Test Adapter with Adapter Lead for L-Jetronic (LE Version)

- 1 = adapter lead (part no. 1 684 463 123)
- 2 = universal test adapter (part no. : 0 684 101 801)
- 3 = test wells (for motortester)
- 4 = test sockets (for voltage measurement)
- 5 = test sockets (for resistance measurement)
- 6 = test sockets (not yet assigned)
- 7 = program switch "volt"
- 8 = program switch "ohm"
- 9 = button panel (not assigned for LE version)



1 = universal test adapter
 2 = multimeter
 3 = LE adapter lead

4 = Jetronic wiring harness
 5 = LE control unit

Connection:

Disconnect control-unit plug of Jetronic wiring harness from control unit and connect to plug of adapter lead.

Caution:

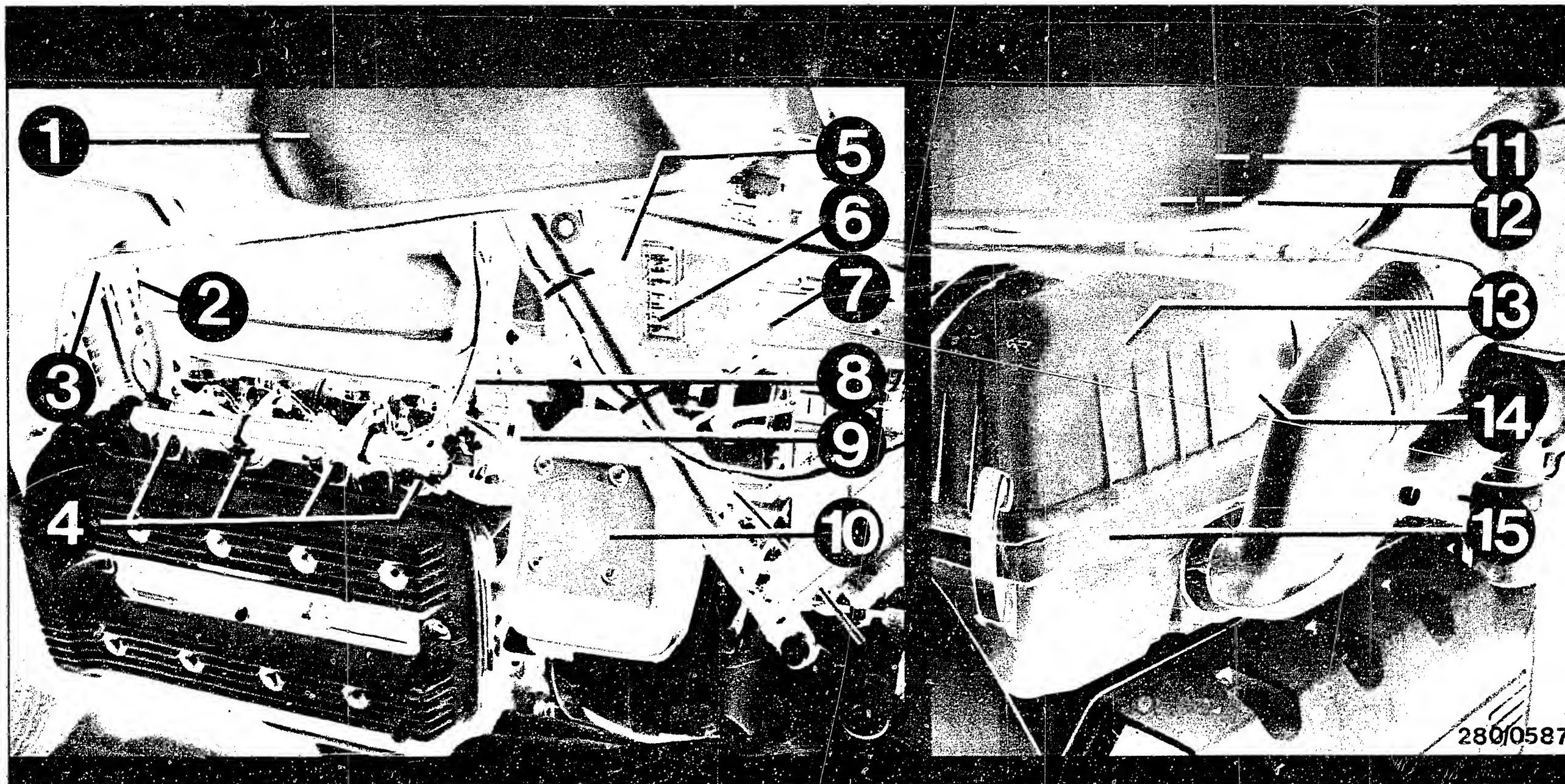
Connect and disconnect the universal test adapter only with the ignition off:

Testing:

For testing, connect a multimeter with R_i min. $20 \text{ k}\Omega/\text{V}$ to the test adapter.

In addition, the signal from terminal 1 of the ignition coil can be measured with a motortester through the special input.





INSTALLATION POSITION OF COMPONENTS

- 1 = electric fuel pump
(in-tank pump) and
fuel filter
- 2 = fuel delivery line
- 3 = fuel return line
- 4 = injection valves

- 5 = central-electrics box
(with injection relay and
starting-interlock relay)
- 6 = fuse box with pump fuse
- 7 = LE control unit

- 8 = pressure regulator
- 9 = throttle-valve switch
- 10 = ignition coils
- 11 = timing-advance unit
- 12 = central ground
- 13 = air-flow sensor

- 14 = temperature sensor
(double NTC)
- 15 = air filter

- Altitude compensation on US version: an additional plug-in connector is attached to the wiring harness under the left-hand side part for switching on the altitude compensation.

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Installation Position
BMW Motorcycle K 100



A16

Installation Position
BMW Motorcycle K 100



IMPORTANT GENERAL INFORMATION

- Never start the engine without the battery firmly connected.
- Do not use a starting aid with more than 16 V or a fast charger for starting.
- Never disconnect the battery from the vehicle electrical system with the engine running.
- Disconnect the battery from the vehicle electrical system for fast charging.
- Remove the control unit at temperatures above 80°C (paint-drying installation).
- Make sure that all connectors of the wiring harness are properly seated.
- Never disconnect or connect the control-unit plug of the control unit with the ignition on.
- When testing compression, cut the power supply by disconnecting the injection relay. This cuts the power supply to the LE version and therefore also to the solenoid-operated injection valves. Undesired injecting is thus prevented.
- Remove the LE control unit for electrical welding work (e.g. spot-welding).
- When using the following trouble-shooting program, it is assumed that the engine is O.K. and that the ignition has been correctly adjusted. The electrical system must be checked and, if necessary, repaired.
- In order quickly to establish whether there is a fault in the ignition system, proceed as follows:
Connect ignition timing light, one after the other, to terminal 1 of ignition coil 1/4 and term. 1 of ignition coil 2/3.
Start engine after each measurement.
The timing light must flash.
If not, check ignition system.

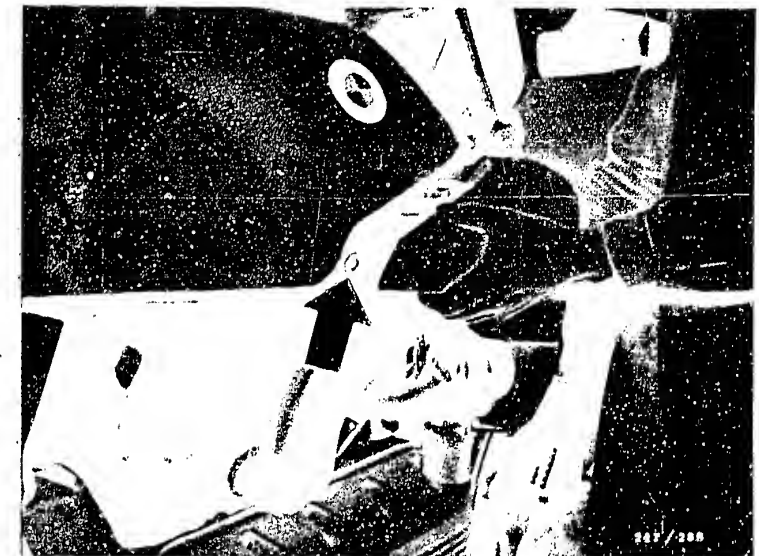
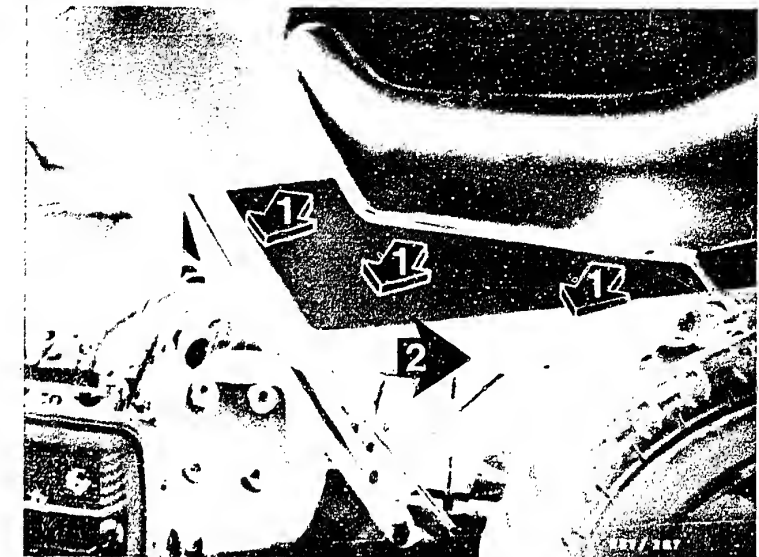


Important General Information (continued)

- In order to be able to perform the testing operations described in this manual and to evaluate the components, you should be familiar with the L-Jetronic and how it works. The essential points of the operation and construction of the L-Jetronic are described in Technical Instruction VDT-U 3/3. The LE version is described in Technical Bulletins VDT-I-280/5, Ed. 2 and VDT-I-280/6.

Preliminary operations in order to be able to remove the fuel tank and the LE control unit and in order to be able to take measurements on timing-advance unit, injection relay and fuse box:

- Take off left-hand and right-hand battery covers (top picture) (rubber plug-in connection). Follow sequence (arrows).
Note on installation: The battery cover can be mounted more easily by moistening the three rubber bearings.
- Unhook radiator cover on left and right (rubber plug-in connection) (center picture). Unscrew three recessed-head fastening screws on radiator cover at front and take off radiator cover. (Bottom picture - arrows).



A18

Important General Information

BMW Motorcycle K 100



A19

Important General Information

BMW Motorcycle K 100



Important General Information (continued)

Removing the fuel tank:

Before removing, note the following:

Top picture:

- Place cleaning rag under the fuel-distribution pipe in order to soak up any escaping fuel.
- Loosen hose clamps (1) and (2); pull off fuel hoses.
- Disconnect plug (top picture - arrow) to in-tank pump.

Center picture:

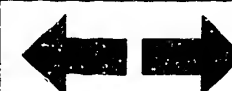
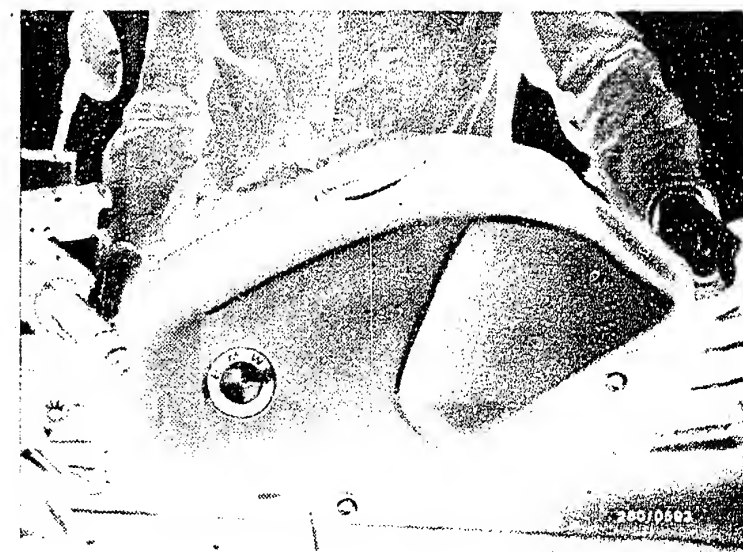
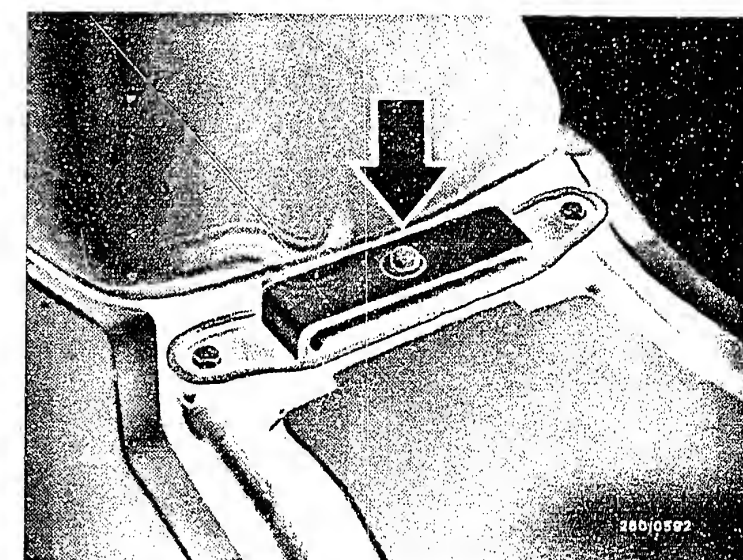
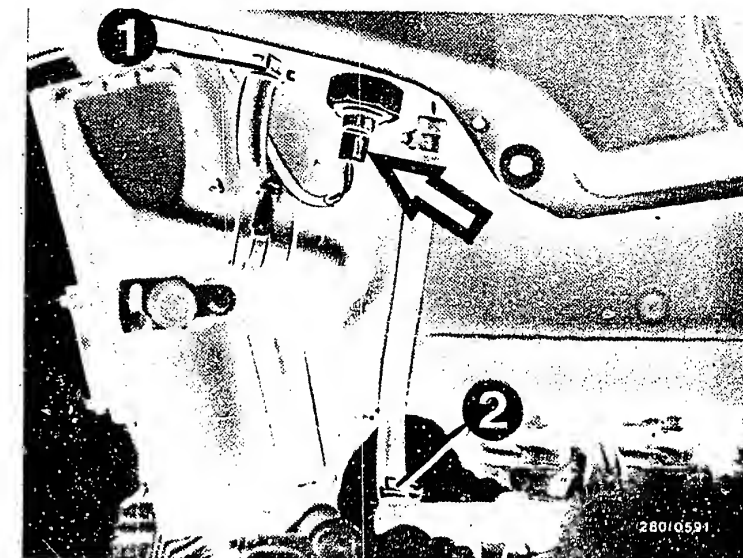
- Hinge up seat bench (unlock with ignition key).
- Unscrew hexagon screw at rear mounting of fuel tank (center picture - arrow).

Bottom picture:

- Disconnect hose from fuel tank vent and overflow on bottom side of fuel tank.
- Lift fuel tank off frame toward rear and up.

Caution:

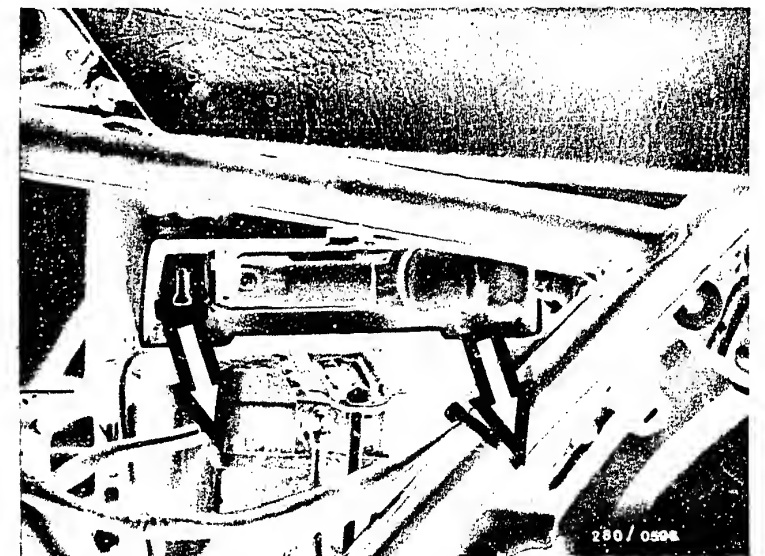
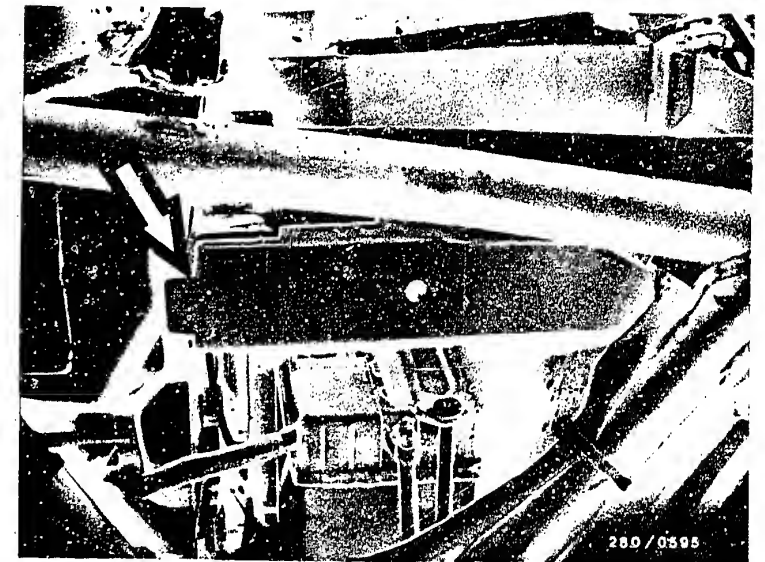
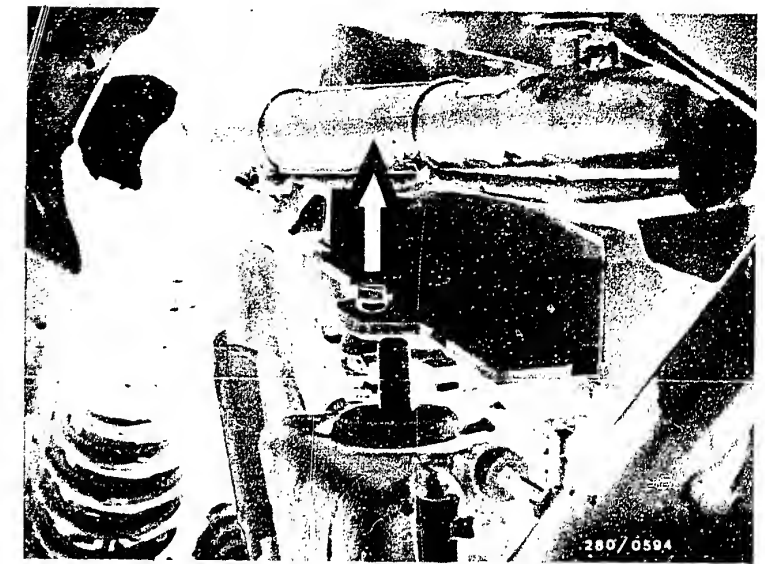
Careful when handling vehicle fuels. Prevent sparks. Danger of fire and explosion.



Important General Information (continued)

Removing the LE Control Unit:

- Hinge up seat bench (unlock with ignition key).
- Pull out right-hand control-unit fastening plug in an upward direction. (Top picture - arrow)
- Take off left-hand cover in front of control unit (center picture - arrow)
- Pull out control unit toward the front (left). Both plugs can remain pressed into the control unit. (Bottom picture - pull in direction of arrow).



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Important General Information
BMW Motorcycle K 100



A23

Important General Information
BMW Motorcycle K 100



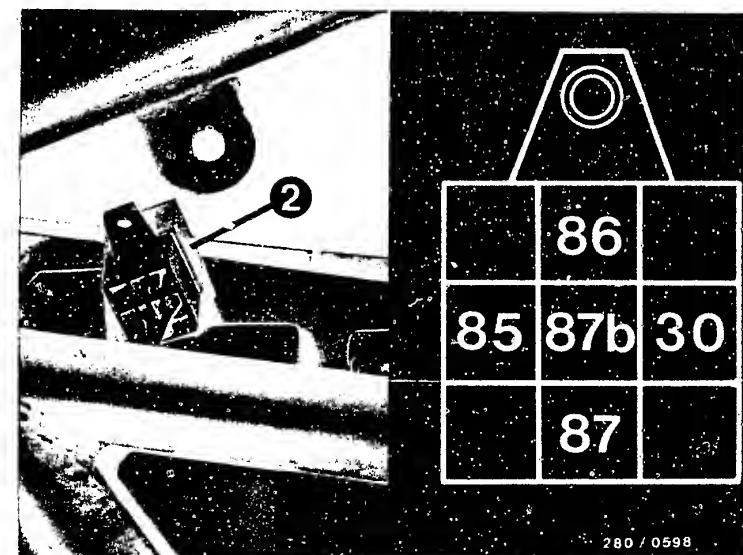
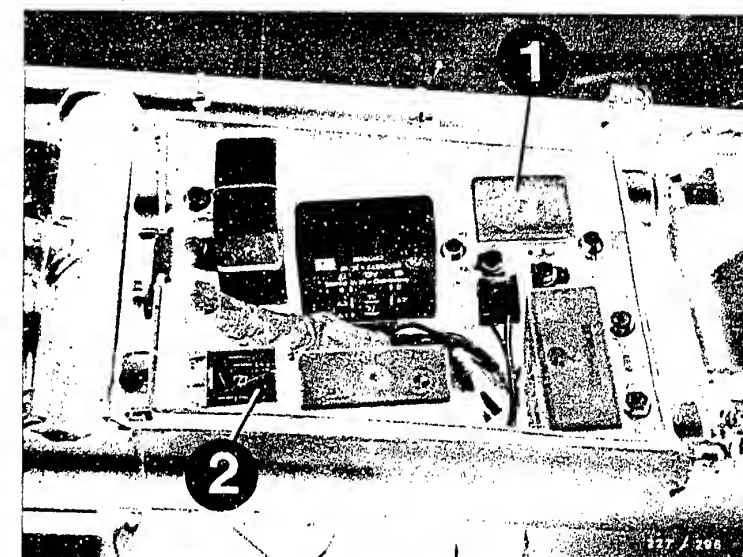
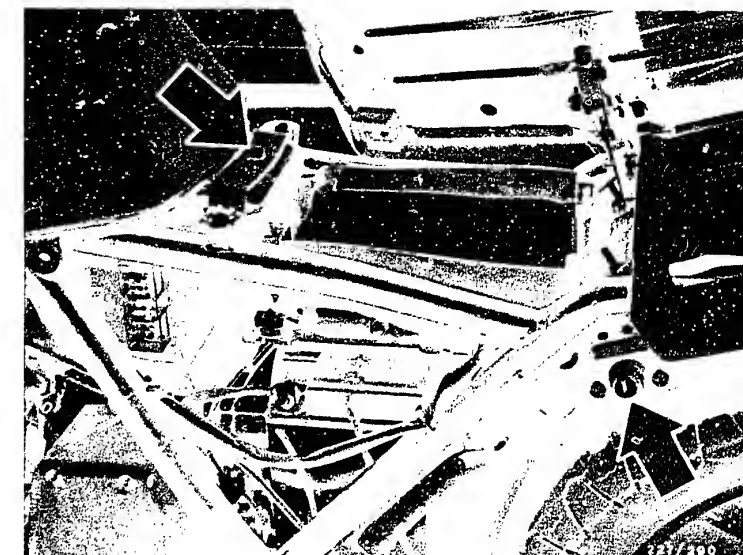
Important General Information (continued)

Checking or replacing the starting-interlock relay and/or injection relay:

- Remove LE control unit.
- Unlock seat bench with ignition key and hinge up.
- Loosen central, rear tank mounting (top picture - arrow).
- Remove tank.
- Remove mounting piece.
- Take cover plate off central-electrics box.
- The appropriate relay bases must be unscrewed for voltage measurements (bottom picture).
The test must be performed with test prods with the relay connected (bottom picture)

1 = starting-interlock relay (starter relay)

2 = injection relay



B1

Important General Information
BMW Motorcycle K 100



B2

Important General Information
BMW Motorcycle K 100



Important General Information (continued)

Fuse Box:

- To take off the transparent cover, press it together lightly (top picture - arrows) and take off.
- Pump fuse (electric fuel pump) (top picture - Item 1).

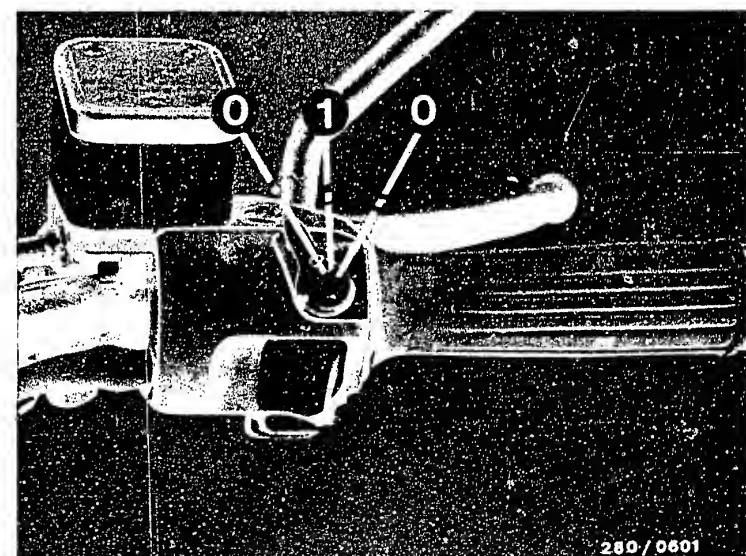
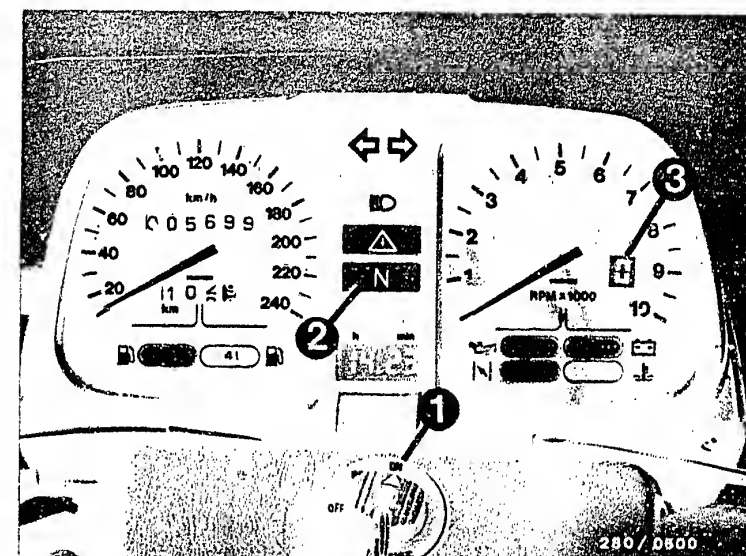
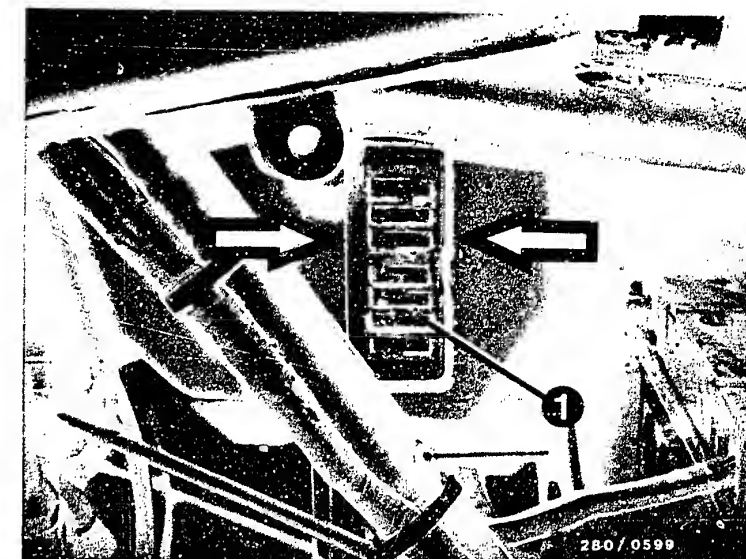
Caution:

The ignition must be switched "ON" for testing. This means:

1. ignition key to setting "ON", i.e. ignition and all circuits on. (center picture - Item 1).
2. set emergency ignition switch to operating position (1); all circuits are activated (bottom picture).
By turning the switch to left or right (into position "0") the engine can be switched off immediately in an emergency situation.
Starting the engine is possible only in the center position (1) because when in the left-hand or right-hand position, the emergency ignition switch interrupts the circuits for ignition, injection, in-tank pump and starting motor. The engine is started by pressing the knob (2) on the emergency ignition switch.

Caution:

Start only if the transmission is at position "N" (see center picture, indicator lamp "N" Item 2).
At the same time, the gear indicator in the tachometer indicates a "0".
(Center picture - Item 3).
Perform switch operations only with the clutch pressed.



B3

Important General Information
BMW Motorcycle K 100



B4

Important General Information
BMW Motorcycle K 100



TROUBLE-SHOOTING CHARTS

Using the universal test adapter with adapter lead (1 684 463 123) and other suitable testers, the following trouble-shooting charts are intended to enable the workshop employees to quickly detect the causes of trouble on the LE version. Depending on the level of training and experience of the mechanic, a choice can be made between the following procedures:

- detailed step-by-step trouble-shooting chart for employees with little practice or experience on vehicles equipped with the LE version. There is a complete trouble-shooting program for each customer complaint.

- pin-pointed, direct trouble-shooting chart for trained and experienced employees with a great deal of practice on vehicles equipped with the LE version.

Trouble-shooting according to customer complaint starts on a specific component within the trouble-shooting program.

Both trouble-shooting charts start by checking the electrical/electronic part of the LE version with the aid of the universal test adapter with adapter lead. This makes it possible to quickly check the electrical operation of the wiring harness with the components connected to it and to detect any faults.

If no fault is found with the universal test adapter, it is necessary to perform the fuel pressure test.

If, once again, no fault is found, continue with the detailed or direct trouble-shooting chart.

C3**C5****C1**

Trouble-shooting Charts

BMW Motorcycle K 100

**C2**

Trouble-shooting Charts

BMW Motorcycle K 100



Detailed, step-by-step trouble-shooting chart for the complete trouble-shooting program

- Electrical test with universal test adapter, adapter lead 1 684 463 123 and motortester/multimeter

This test must come at the start of the testing program and must be performed from beginning to end (Coordinates C9...D14).

- Fuel pressure test with pressure gauge

This test must come immediately after the test with the universal test adapter and must be performed from beginning to end (Coordinates E1...E16).

- Trouble-shooting according to customer complaints (fault symptoms)

The table below contains possible fault symptoms and the right-hand column gives the first coordinate of the respective detailed trouble-shooting program. This trouble-shooting program consists of logically ordered test steps for all individual components of the LE version. If, after completing the trouble-shooting program for an assumed symptom, the fault has not been detected or remedied, choose another fault symptom and work through a different program.

| <u>Customer Complaints</u> (fault symptoms) | <u>Electrical Test with Universal Test Adapter</u> | <u>Fuel Pressure Test with Pressure Gauge</u> | <u>Trouble-shooting Program</u> |
|--|--|---|---------------------------------|
| 1. Starting motor operates, engine fails to start or starts only with great difficulty | C 9 | E 1 | F 1 |
| 2. Engine starts but then dies | C 9 | E 1 | F 17 |
| 3. Rough idle/incorrect idle speed | C 9 | E 1 | G 5 |
| 4. Poor throttle take-up | C 9 | E 1 | H 1 |
| 5. Engine missing under all operating conditions | C 9 | E 1 | H 17 |
| 6. Fuel consumption too high | C 9 | E 1 | K 1 |
| 7. Maximum engine power/top speed not reached | C 9 | E 1 | L 1 |
| 8. Idle speed and CO concentration too low or too high | C 9 | E 1 | M 1 |

C3

Trouble-shooting Charts
BMW Motorcycle K 100



C4

Trouble-shooting Charts
BMW Motorcycle K 100



Pin-pointed, direct trouble-shooting chart for components within the trouble-shooting programs

- Electrical test with universal test adapter, adapter lead 1 684 463 123 and motortester/multimeter

This test must come at the start of the testing program and must be performed from beginning to end (Coordinates C9...D14).

- Fuel pressure test with pressure gauge

This test must come immediately after the test with the universal test adapter and must be performed from beginning to end (Coordinates E1...E16).

- Trouble-shooting according to customer complaint

The table below contains various fault symptoms with several possible causes of the trouble in each case. The reference panel indicates the first coordinate of the test procedure for the respective individual component of the LE version. If, after testing the individual components, the fault has not been detected or remedied, choose a new fault symptom.

Customer Complaints (fault symptoms)

| | | | | | | | | |
|--|----|-----|----|-----|----|-----|----|---|
| 1. Starting motor operates, engine fails to start or starts only with great difficulty | | | | | | | | |
| 2. Engine starts but then dies | | | | | | | | |
| 3. Rough idle/incorrect idle speed | | | | | | | | |
| 4. Poor throttle take-up | | | | | | | | |
| 5. Engine missing under all operating conditions | | | | | | | | |
| 6. Fuel consumption too high | | | | | | | | |
| 7. Maximum engine power/top speed not reached | | | | | | | | |
| 8. Idle speed and CO concentration too low or too high | | | | | | | | |
| <u>Cause</u> (component fault) | | | | | | | | |
| C9 | C9 | C9 | C9 | C9 | C9 | C9 | C9 | Fault in electrics. Test with universal test adapter. |
| E1 | E1 | E1 | E1 | E1 | E1 | E1 | E1 | Fault in fuel supply. Pressure regulator defective. Injection relay defective. In-tank pump not operating - fuel pressure test. Power supply to in-tank pump. Jumping the safety circuit. |
| F11 | | G15 | H5 | H21 | K9 | L11 | M7 | Air-flow sensor defective. |
| | | | H7 | H23 | | | | Air-flow sensor, potentiometer test (noise test) |
| | | | | H19 | | | | Voltage peaks. |

C5

Trouble-shooting Charts

BMW Motorcycle K 100



C6

Trouble-shooting Charts

BMW Motorcycle K 100



Customer Complaints (fault symptoms)

1. Starting motor operates, engine fails to start or starts only with great difficulty
2. Engine starts but then dies
3. Rough idle/incorrect idle speed
4. Poor throttle take-up
5. Engine missing under all operating conditions
6. Fuel consumption too high
7. Maximum engine power/top speed not reached
8. Idle speed and CO concentration too low or too high

Cause (component fault)

| | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|--|
| F3 | | | | | | | M9 | Cold-start control defective |
| F13 | G1 | G17 | H11 | | | L13 | M19 | Air-intake system leaking |
| | | G11 | | J15 | | | | Injection valves defective. Connect test lead; functional test |
| | E23 | | | | K7 | | M17 | Injection valves leaking |
| | | G13 | | J17 | K5 | | | Injection valves defective; mechanical test |
| | | | | J3 | | L7 | | Fuel delivery of electric fuel pump too low |
| | F19 | G7 | H3 | | K3 | | | Throttle-valve adjustment incorrect; choke adjustment |
| | | G7 | H3 | | K3 | | | Throttle valve not closing (test overrun cutoff) |
| | | | | | | L3 | | Throttle valves not opening fully |
| | | | | J7 | | | | Exhaust coughing |
| | | | | | | L5 | | Throttle-valve switch defective |
| | | G9 | H13 | J13 | K11 | | M21 | CO Exhaust-gas setting too rich, idle adjustment |
| | | G9 | H13 | | | | M21 | CO Exhaust-gas setting too lean, idle adjustment |
| | | | | J7 | | L5 | | Control unit defective |

C7

Trouble-shooting Charts

BMW Motorcycle K 100



C8

Trouble-shooting Charts

BMW Motorcycle K 100



TEST CHART FOR UNIVERSAL TEST ADAPTER

with connected adapter lead 1 684 463 123 for LE version in
BMW motorcycle K 100 (as of 9.83). EU version and US version (as of 4.84)

- Before testing with the universal test adapter, check all multiple plug-in connections for loose contacts.
Clean plug-in contacts if dirty or corroded.
- Watch for receptacles which have been pushed back.
If necessary, bend back locking lug and press receptacle as far as it will go into plug housing. Locking lug latches.
- Suspicion of line breaks in the case of kinking and pinching.

Installation Position of Control Unit: Under seat bench transverse to the forward direction of travel.

The universal test adapter tests only the peripherals of the electrics (excluding control unit).

Disconnect control-unit plug of Jetronic wiring harness from control unit and connect to plug of adapter lead (ignition must be off).

In order to take the measurements, connect a multimeter for voltage and resistance measurements as well as a motortester to the universal test adapter.

The individual test steps are selected by means of two program switches (one for voltage measurements, the other for resistance measurements). Each program switch has 24 test settings, only some of which, however, are assigned for the LE version. If a fault is detected during a test, the test must be repeated after the fault has been remedied.

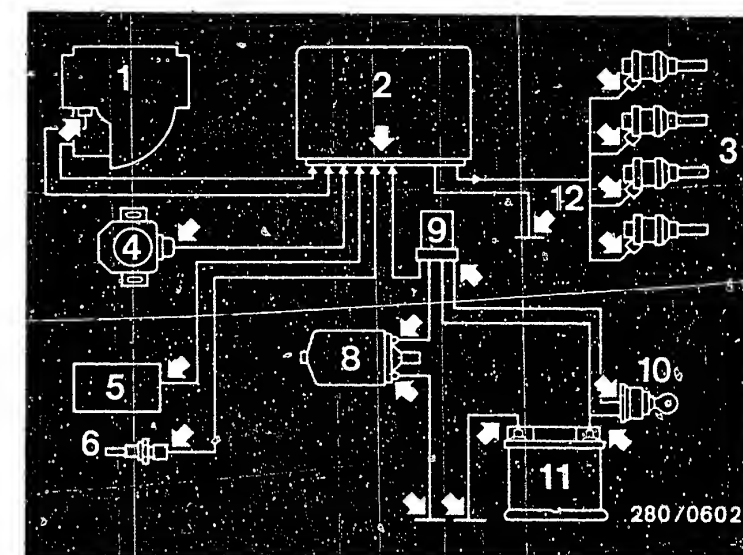
Always perform the test with the universal test adapter from beginning to end.

Be sure to follow the instructions in the test chart.

- Test steps 1...4 measure the voltages during starting. Set the multimeter to "voltage measuring range".
- Test steps 5...11 measure resistances.
Set the multimeter to "resistance measuring range"
Test specifications and notes on how to operate the universal test adapter are given in the following test chart.

Make sure of the following in order to ensure correct test procedure:

1. The trouble-shooting given in the following test steps builds on the trouble-shooting given for the preceding test steps.
Example: when in test step 1, the ground connection term. 5 for the control unit is tested, this test is no longer repeated in the following test steps.
2. If an incorrect reading is indicated for a test step, this test step must be repeated after the fault has been remedied.



Electrical plug-in connections
(arrows)

- 1=air-flow sensor
- 2=control unit
- 3= injection valves
- 4=throttle-valve switch
- 5=timing-advance unit
- 6=temperature sensor (engine)
- 8=electric fuel pump
- 9= injection relay
- 10=ignition lock
- 11=battery
- 12=electronics/output stage ground terminal



Notes:

In the following test steps a white border in the "Operation" column indicates which operation has to be changed compared to the preceding test step.

TEST STEP 1

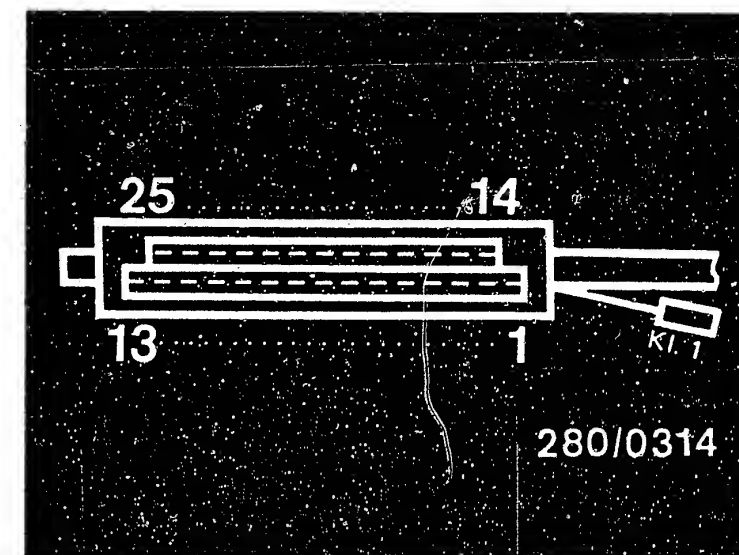
| Operation | Reading | Testing |
|---|--|--|
| Program switch "V" at position 5 | Measuring equipment must indicate change in resistance. | Component: Signal from term. t_D |
| Program switch "Ω" at position 1) | | |
| Measuring equipment: Motor-tester or multimeter (Ω Range) | <div> <div>yes</div> <div>no</div> </div> | Operation: Triggering of control unit by the ignition Malfunction: No change of reading |
| Measuring range: min. 200 kΩ Caution: resistance measurement in red (positive) and black (negative) test sockets | | |
| Connection: Red (positive) and black (negative) test sockets Ensure correct polarity of measuring equipment | Continue testing with next test step. | |
| Operation in vehicle: Measurement 1 - at rest Measurement 2 - ignition "ON" and start | Trouble-shooting For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary. • If deflection of tachometer, check wiring harness (t_D lead) for open circuit. | |

If not, check ignition trigger box.

Caution: Use only the specified measuring equipment. With other measuring equipment there is the danger of destroying the ignition trigger box.

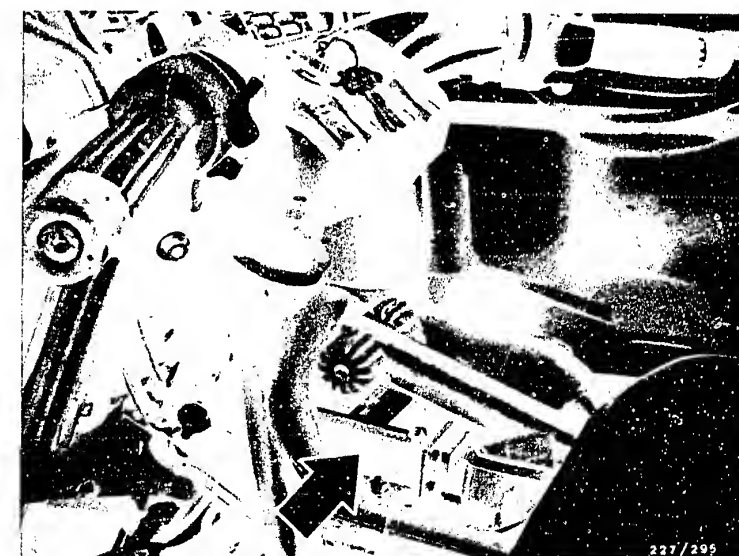
Continued on C13/C14

1) Switch setting not specified



Top view of control-unit plug

Arrow = timing-advance unit (under fuel tank)



C11

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



C12

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



Trouble-shooting from test step 1 (continued)

Check the following leads for continuity with ohmmeter (set value 0 Ω):

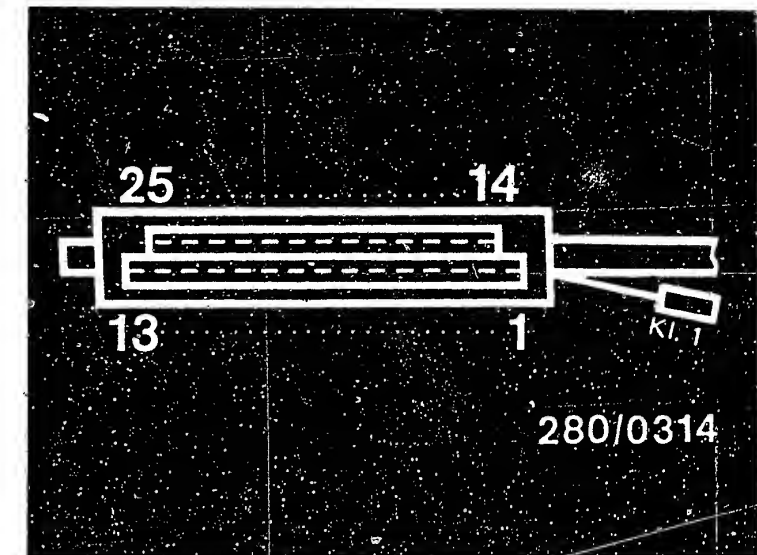
- From control-unit plug term. 1 to ignition trigger box term. 8.
- From ignition trigger box term. 14 to ignition coil I term. 1.
- From ignition trigger box term. 9 to ignition coil II term. 2.
- From control-unit plug term. 5 to central ground.
- Eliminate contact resistances in the plug-in connections.

Installation Position of Components:

Timing-advance unit: Under fuel tank.

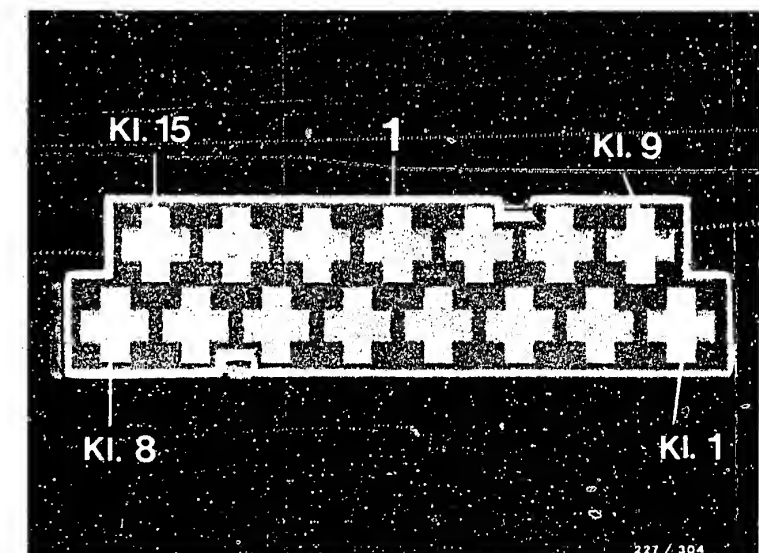
Ignition coils: On left between engine block and fuse box.

Central ground: Under fuel tank on frame.



Top view of control-unit plug

1 = timing-advance unit plug



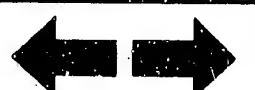
C13

Test Chart for Universal Test Adapter
BMW Motorcycle K 100

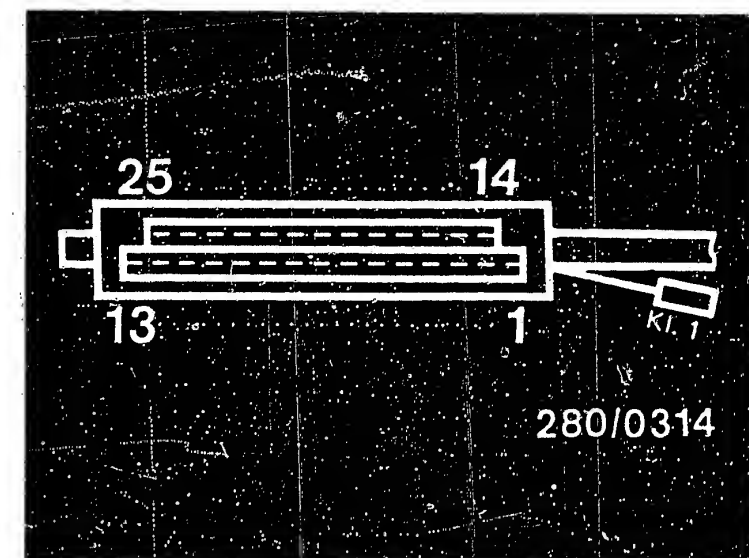


C14

Test Chart for Universal Test Adapter
BMW Motorcycle K 100

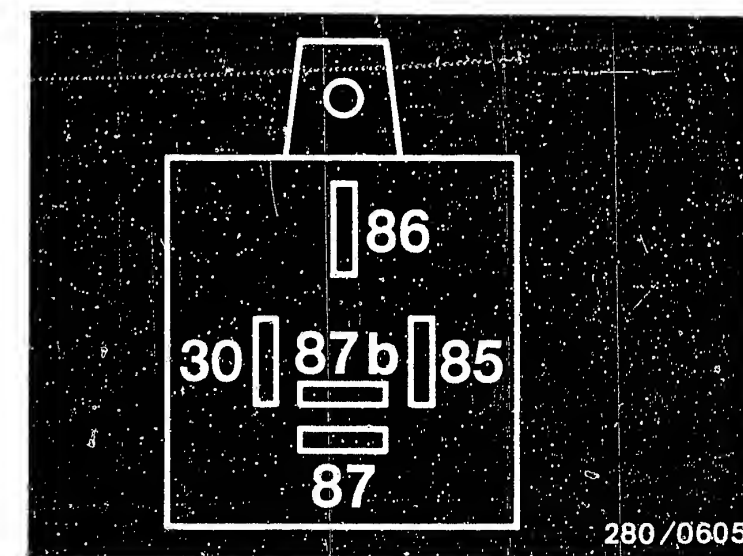


| TEST STEP 2 | | |
|---|--|---|
| Operation | Reading | Testing |
| Program switch "V" at position | 6 | Component: Injection relay Power supply |
| Program switch "Ω" at position | - | |
| Measuring equipment: Motor-tester or multimeter (volt range) | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> yes ↓ Continue testing with next test step </div> <div style="text-align: center;"> no ↓ </div> </div> | Operation: Power supply from term. 87 |
| Measuring range: 0 ... 15 V | | |
| Connection: Red (positive) and black (negative) test sockets | | Malfunction: No voltage reading |
| Operation in vehicle: Ignition "ON" and start | | |

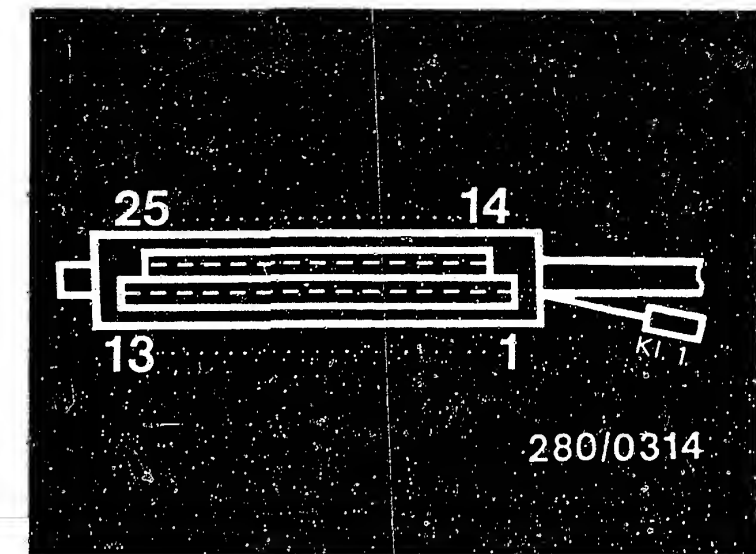


Top view of control-unit plug

Injection relay
(top view of connection base)



| TEST STEP 4 | | | |
|--|---|---|--|
| Operation | | Reading | Testing |
| Program switch "V" at position | 8 | Measuring equipment must indicate 8 ... 15 V at altitudes above 1200 m. | Component: Jumper in wiring harness |
| Program switch "Ω" at position | - | | |
| Measuring equipment: Motor-tester or multimeter (volt range) | | <div> <div>yes</div> <div>no</div> </div> | Operation: Altitude compensation. On control-unit plug between term. 11 and term. 5 Malfunction: No voltage reading/voltage reading not within tolerance |
| Measuring range: 0 ... 15 V | | | |
| Connection: Red (positive) and black (negative) test sockets | | | |
| Operation in vehicle: Ignition "ON" and start | | | |



Top view of control-unit plug

Trouble-shooting:

For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary.

Check the following leads for continuity with ohmmeter (set value approx. 0 Ω):

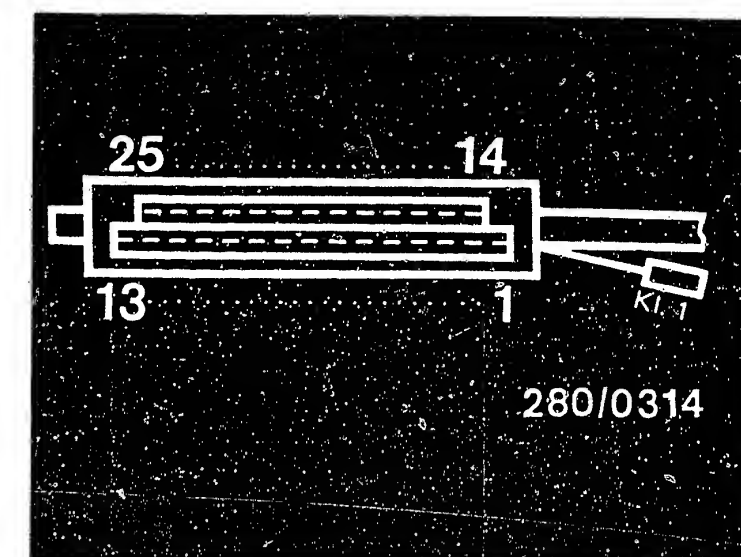
- From control-unit plug term. 11 to altitude compensation jumper term. 11
- From control-unit plug term. 9 to altitude compensation jumper term. 9
- Altitude compensation connected? At altitudes above 1200 m the altitude compensation must be connected in order to comply with the emission regulations (5% leaning)
- Eliminate contact resistances at the plug-in connections.

Installation Position of Components:

Altitude compensation: an additional plug-in connector is mounted under the left-hand side part.

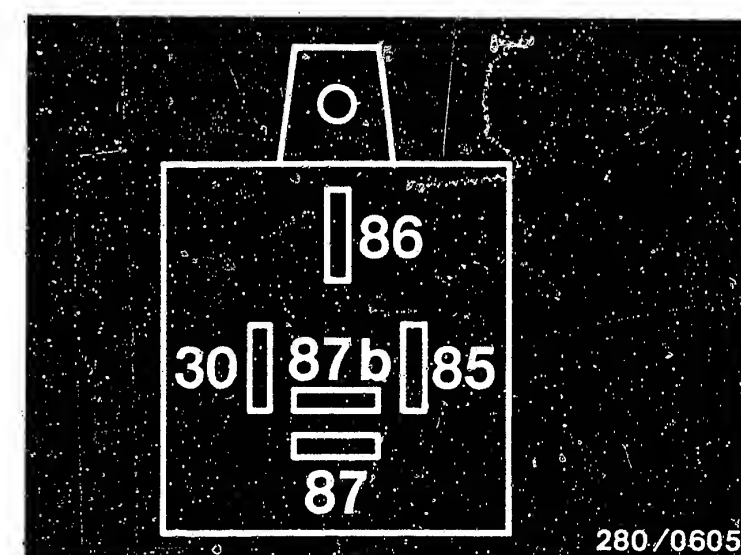


| TEST STEP 5 | | | | |
|--|----|--|---|--|
| Operation | | Reading | Testing | |
| Program switch "V" at position | ↓ | Measuring equipment must indicate 100 ... 200 Ω 1) 340 ... 450 Ω | Component: Among other things air-flow sensor (temperature sensor I) | |
| Program switch "Ω" at position | 11 | | | |
| Measuring equipment: Motor-tester or multimeter (Ω range) | | | Operation: Resistance between control unit term. 8 and central ground Malfunction: Resistance not within tolerance | |
| Measuring range: x 10 Ω | | | | |
| Connection: Blue test sockets. | | | | |
| Operation in vehicle: Disconnect injection relay and insert a jumper into the base between term. 87 and term. 87b. 1) without jumper | | | | |
| | | yes ↓ | no ↓ | |
| | | Continue testing with next test step | | |



Top view of control-unit plug

Injection relay
(top view of connection base)



Trouble-shooting:

For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary.

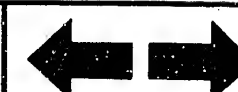
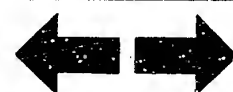
Check the following leads for continuity with ohmmeter (set value approx. 0 Ω):

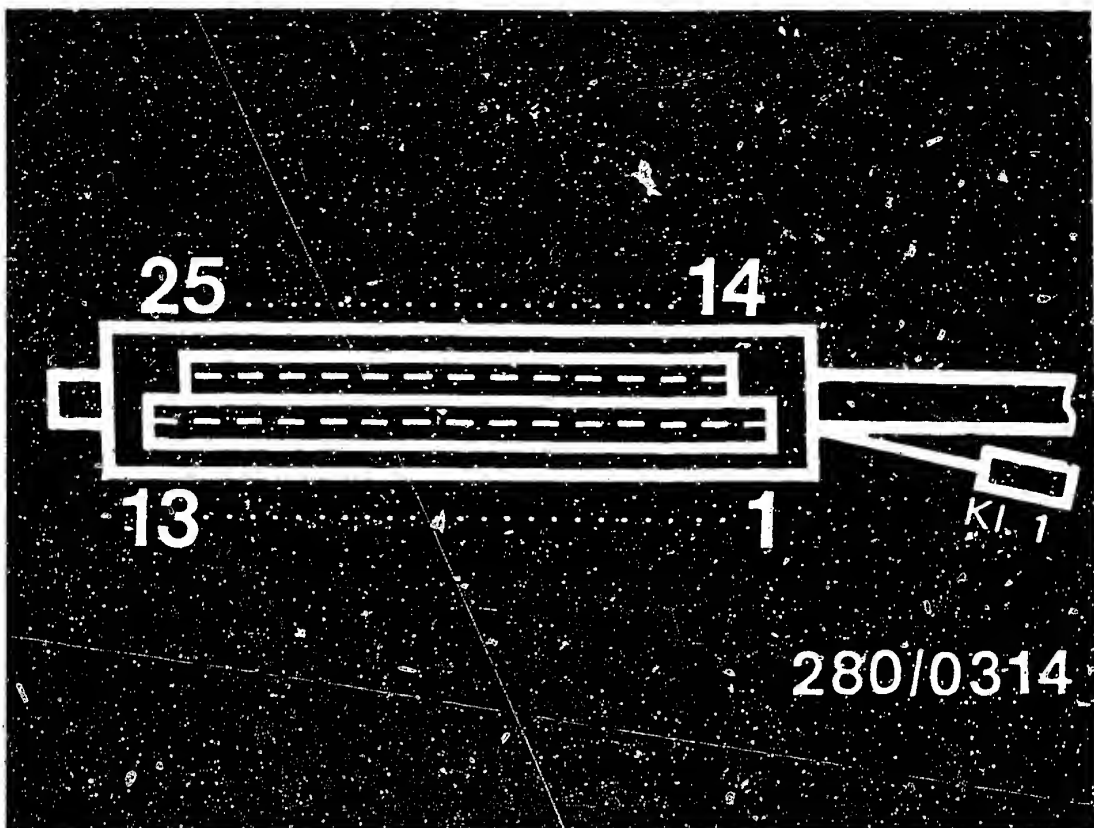
Electric Fuel Pump

- From injection relay term. 87b via pump fuse (in fuse box no. 6) to in-tank pump (positive terminal)
- From in-tank pump (negative terminal) to ground terminal on body

1) Reading if testing without jumper

Continued on C23





Top view of control-unit plug

Trouble-shooting - TEST STEP 5 (continued)

Air-flow sensor

- From control-unit plug term. 8 to air-flow sensor term. 8
- From air-flow sensor term. 5 to central ground
- Eliminate contact resistances in the plug-in connections.

Installation Position of Components:

Air-flow sensor: On right in air-filter cover
 Central ground: Under fuel tank on frame
 Injection relay: In central-electrics box under fuel tank



| TEST STEP 6 | | |
|---|--|---|
| Operation | Reading | Testing |
| <u>Program switch "V"</u> at position | Measuring equipment must indicate <u>60 ... 1000 Ω</u> | <u>Component:</u> <u>Air-flow sensor</u> (potentiometer) |
| <u>Program switch "Ω"</u> at position | | |
| <u>Measuring equipment:</u> Motor- tester or multimeter (Ω range) | | <u>Operation:</u> Resistance between control unit term. 7 and central ground |
| <u>Measuring range:</u> x 10 Ω | | |
| <u>Connection:</u> Blue test sockets. | | <u>Malfunction:</u> Resistance not within tolerance. |
| <u>Operation in vehicle:</u> Fully deflect air-flow sensor flap | | |
| yes ↓ Continue testing with next test step | | no ↓ |

Trouble-shooting:

For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary.

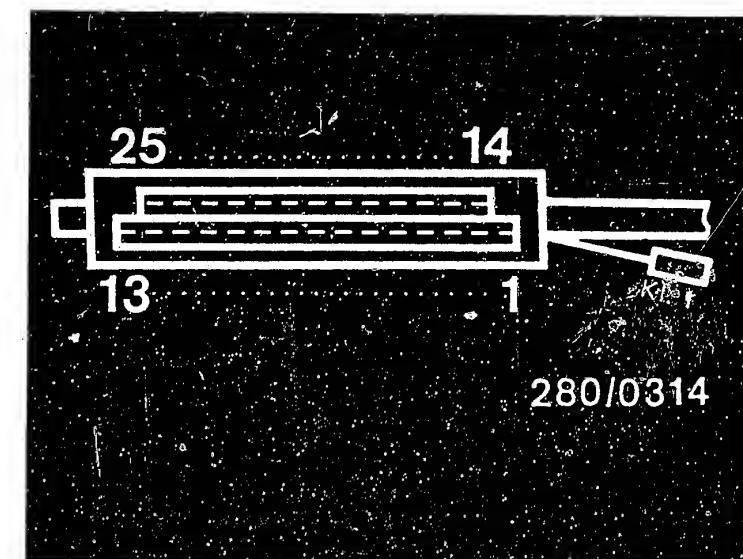
Check the following leads for continuity with ohmmeter (set value approx. 0 Ω):

- From control-unit plug term. 7 to air-flow sensor term. 7
- From air-flow sensor term. 5 to control-unit plug term. 5

Eliminate contact resistances at the plug-in connections.

Installation Position of Components:

Air-flow sensor: On right in air-filter cover
Central ground: Under fuel tank on frame



Top view of control-unit plug

D1

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



D2

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



| TEST STEP 7 | | |
|--|--|---|
| Operation | Reading | Testing |
| Program switch "V" at position | <div>↓</div> | Component: Temperature sensor II (engine) |
| Program switch "Ω" at position | | |
| Measuring equipment: Motor- tester or multimeter (Ω range) | 13 | Operation: Resistance between control unit term. 10 and central ground |
| Measuring range: x 10 Ω or x 100 Ω | Measuring equipment must indicate 1.45 ... 3.3 kΩ at ambient temperature (+15°C ... +30°C) and 280 ... 360 Ω with engine at normal op. temp. (approx. +80°C). | |
| Connection: Blue test sockets | <div>yes</div> <div>↓</div> Continue testing with next test step | Malfunction: Resistance not within tolerance |
| Operation in vehicle: ----- | <div>no</div> <div>↓</div> | |

Trouble-shooting:

For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary.

Measure resistance directly at engine temperature sensor (double NTC).

Ambient temperature (+15°C ... +30°C): 1.45 ... 3.3 kΩ

Engine at normal op. temp. (+80°C): 280 ... 360 Ω

Check the following leads for continuity with ohmmeter
(set value 0 Ω):

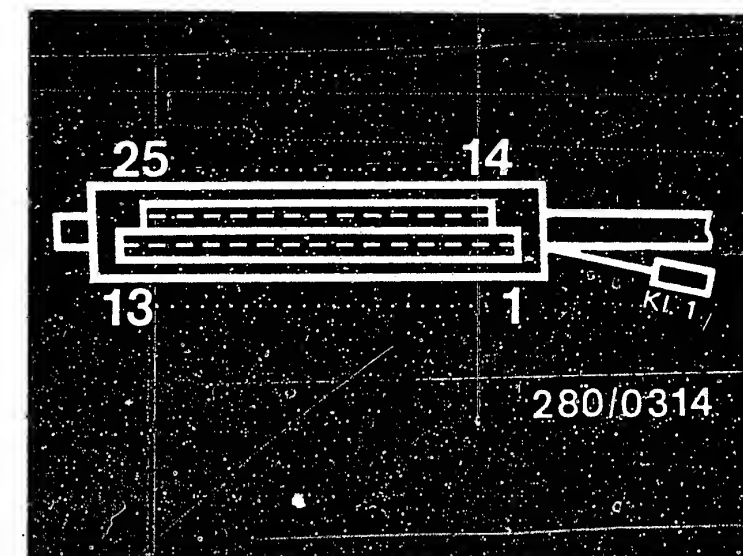
- From control-unit plug term. 10 to temperature sensor II (engine)
See (1).
- From ground on temperature sensor to central ground.

Eliminate contact resistances in the plug-in connections.

Installation Position of Components:

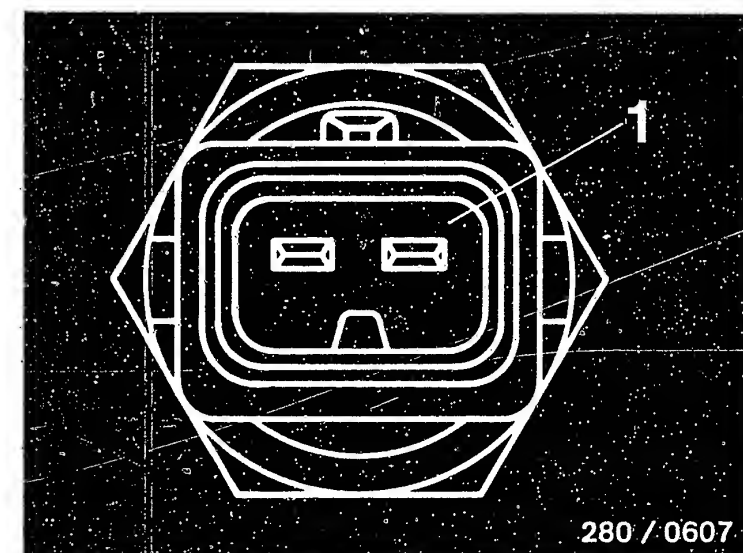
Temperature sensor (water) (double NTC): On right on engine block behind
air guide to air-flow sensor

Central ground: Under fuel tank on frame



Top view of control-unit plug

Top view of temperature-sensor plug
for LE version (1)



D3

Test Chart for Universal Test Adapter
BMW Motorcycle K 100

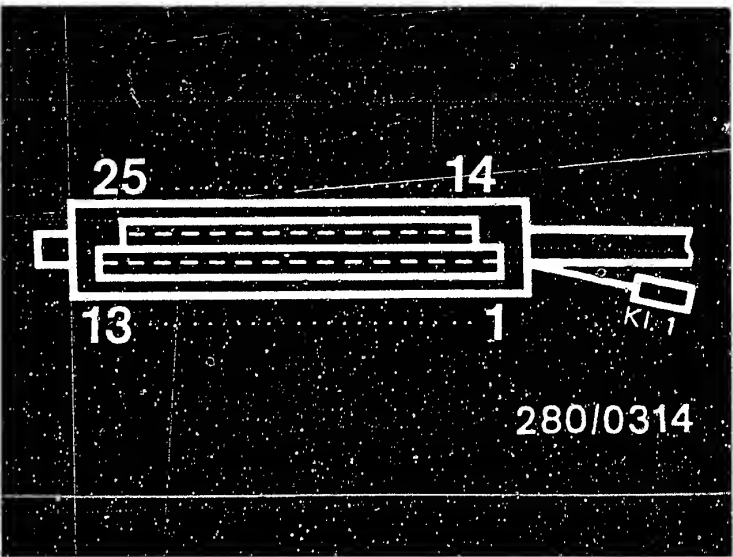


D4

Test Chart for Universal Test Adapter
BMW Motorcycle K 100

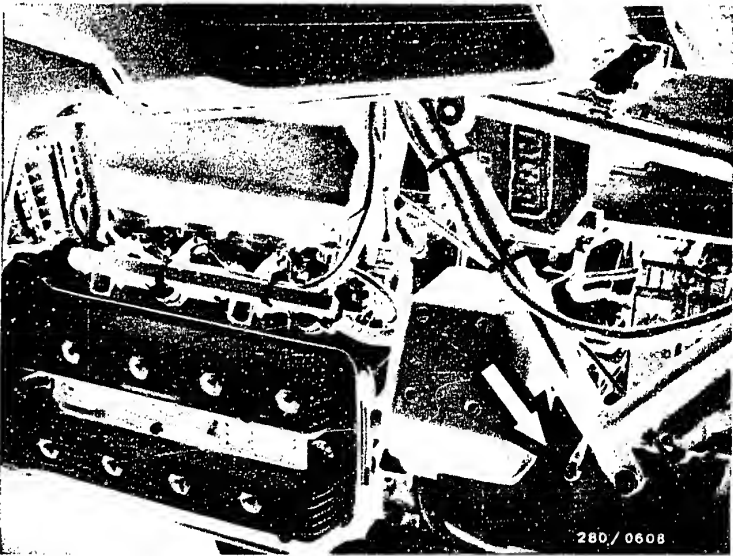


| TEST STEP 8 | | | | |
|---|----|---|--|--|
| Operation | | Reading | Testing | |
| Program switch "V" at position | ↓ | Measuring equipment must indicate 0 ... 10 Ω | Component: Ground connection of output stage | |
| Program switch "Ω" at position | 14 | | | |
| Measuring equipment: Motor-tester or multimeter (Ω range) | | <div> <div>yes</div> <div>↓</div> <div>Continue testing with next test step</div> </div> <div>no</div> <div>↓</div> | Operation: Ground connection from control unit term. 13 | |
| Measuring range: x 1 Ω | | | Malfunction: Resistance not within tolerance | |
| Connection: Blue test sockets | | | | |
| Operation in vehicle: ----- | | | | |



Top view of control-unit plug

Arrow = central ground



| TEST STEP 9 | | | |
|---|----|---|--|
| Operation | | Reading | Testing |
| Program switch "V" at position | ↓ | Measuring equipment must indicate <u>0 ... 10 Ω</u> | Component: Throttle-valve switch (idle contact) |
| Program switch "Ω" at position | 16 | | |
| Measuring equipment: Motor tester or multimeter (Ω range) | | <div><div>yes</div><div>↓</div><div>Continue testing with next test step</div></div> <div>no</div> <div>↓</div> | Operation: Resistance of throttle- valve switch control unit term. 2 and term. 9 Malfunction: Resistance not within tolerance |
| Measuring range: x 1 Ω | | | |
| Connection: Blue test sockets | | | |
| Operation in vehicle: Throttle grip in rest position. Choke in "zero" setting | | | |

Trouble-shooting:

For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary.

Caution: Choke must be at setting "0".

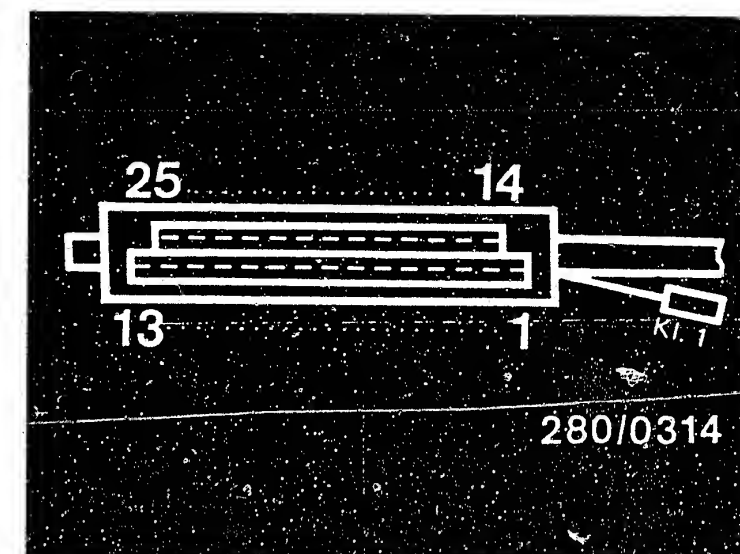
Adjusting the throttle-valve switch

Slightly loosen fastening screws of throttle-valve switch.

Connect ohmmeter to throttle-valve switch between term. 2 and lead 9 (term. 18). Turn throttle-valve switch to the right until the idle contact (microswitch) can be heard to click. (Reading 0 Ω).

Checking the adjustment: Turn throttle grip slightly. The idle contact (microswitch) must be heard to click (Reading $\infty \Omega$).

Continued on D9



Top view of control-unit plug

D7

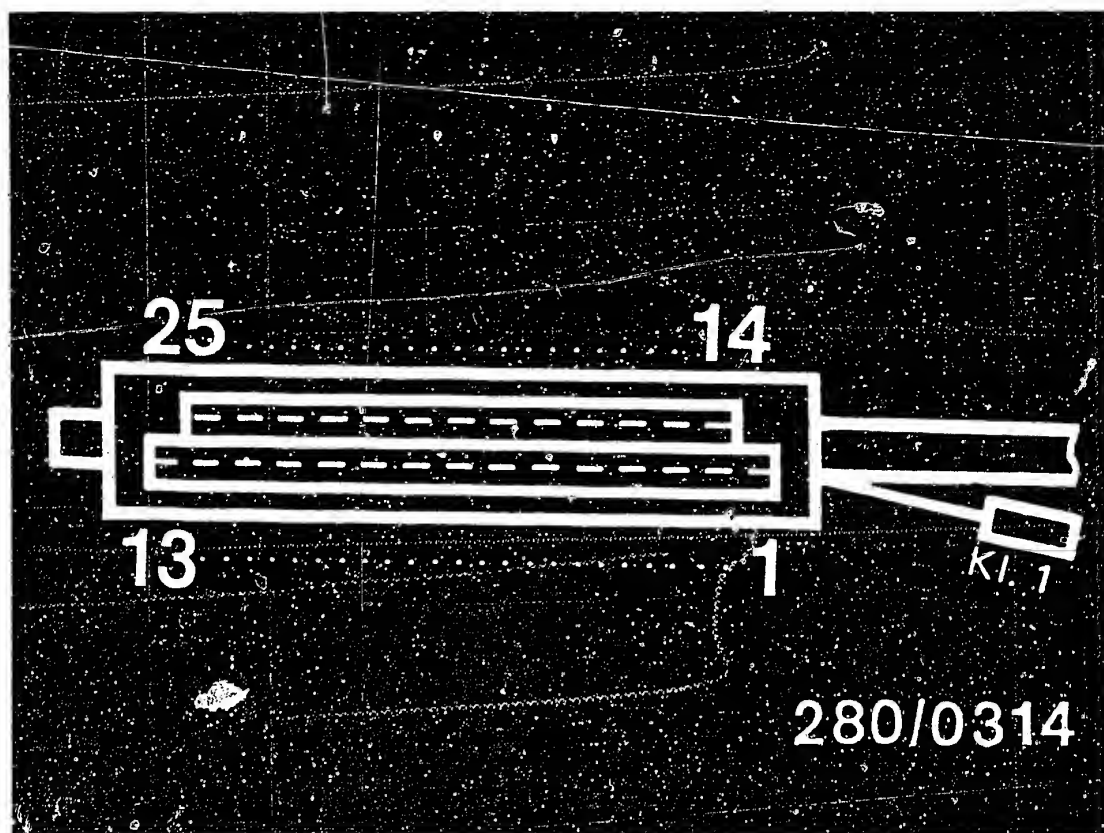
Test Chart for Universal Test Adapter
BMW Motorcycle K 100



D8

Test Chart for Universal Test Adapter
BMW Motorcycle K 100





Top view of control-unit plug

Trouble-shooting - TEST STEP 9 (continued)

Check the following leads for continuity with ohmmeter (set value approx. 0 Ω)

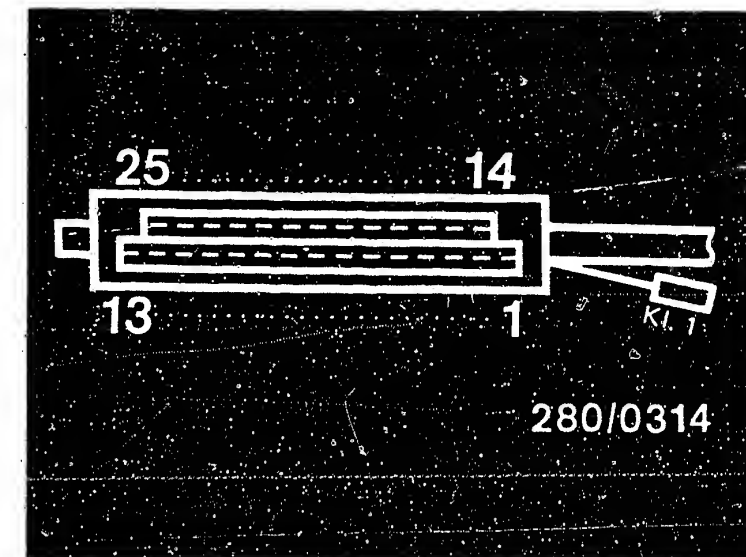
- From control-unit plug term. 2 to throttle-valve switch term. 2
- From throttle-valve switch lead 9 (term. 18) to control-unit plug term. 9

Eliminate contact resistances in the plug-in connections.

Installation Position of Components

Throttle-valve switch: On left, near intake port for cylinder 4.

| TEST STEP 10 | | | |
|---|---|---|--|
| Operation | | Reading | Testing |
| Program switch "V" at position | ↓ | Measuring equipment must indicate 0 ... 10 Ω | Component: Throttle-valve switch (full-load contact) |
| Program switch "Ω" at position | 17 | | |
| Measuring equipment: Motor-tester or multimeter (Ω range) | <div> <div>yes</div> <div>↓</div> <div>Continue testing with next test step</div> </div> <div>no</div> <div>↓</div> | | Operation: Resistance of throttle-valve switch control unit term. 3 and term. 9 |
| Measuring range: x 1 Ω | | | Malfunction: Resistance not within tolerance |
| Connection: Blue test sockets | | | |
| Operation in vehicle: Throttle-grip in full-load pos. | | | |



Top view of control-unit plug

Trouble-shooting:

For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary.

Check the following leads for continuity with ohmmeter (set value approx. 0 Ω)

- From control-unit plug term. 3 to throttle-valve switch term. 3
- From throttle-valve switch lead 9 (term. 18) to control-unit plug term. 9

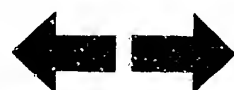
Eliminate contact resistances in the plug-in connections.

Installation Position of Components:

Throttle-valve switch: On left near intake port for cylinder 4

D10

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



D11

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



| TEST STEP 11 | | | |
|--|----|---|---|
| Operation | | Reading | Testing |
| Program switch "V" at position | ↓ | 1) Injection valve ... 210 | Component: Injection valves 1, 2, 3 and 4 |
| Program switch "Ω" at position | 18 | at +15°C ... +30°C): 7.00 ... 9.50 Ω at +80°C: 7.20 ... 10.0 Ω | |
| Measuring equipment: Motor- tester or multimeter (Ω range) | | 2) Injection valve ... 705 | Operation: Resistance of all 4 injection valves (in parallel) control unit term. 12 and term. 9 |
| Measuring range: x 1 Ω | | at +15°C ... +30°C): 6.80 ... 9.30 Ω at +80°C: 7.00 ... 9.80 Ω | |
| Connection: Blue test sockets | | ↓ yes | Malfunction: Resistance not within tolerance |
| Operation in vehicle: ----- | | no Continue testing with next test step | |

Trouble-shooting:

For testing, disconnect control-unit plug from test adapter and use circuit diagram if necessary.

Check the following leads for continuity with ohmmeter
(set value approx. 0 Ω)

- From control-unit plug term. 12 to the injection valves
- From the injection valves to injection relay term. 87
- From the injection valves to control-unit plug term. 9

Resistance measurement at injection valve ... 210:

Ambient temperature (+15°C ... +30°C): 15 ... 17.5 Ω

Engine at normal op. temp. (approx. +80°C): 17 ... 20 Ω

Resistance measurement at injection valve ... 705:

Ambient temperature (+15°C ... +30°C): 14.5 ... 17.0 Ω

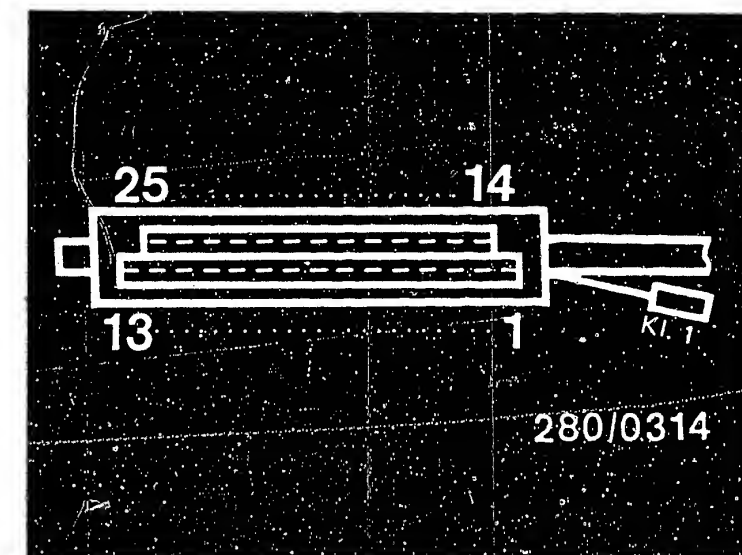
Engine at normal op. temp. (approx. +80°C): 16.5 ... 19.5 Ω

If reading too high: Open circuit in valve coil or a valve connector has dropped off.

Check seating of contacts.

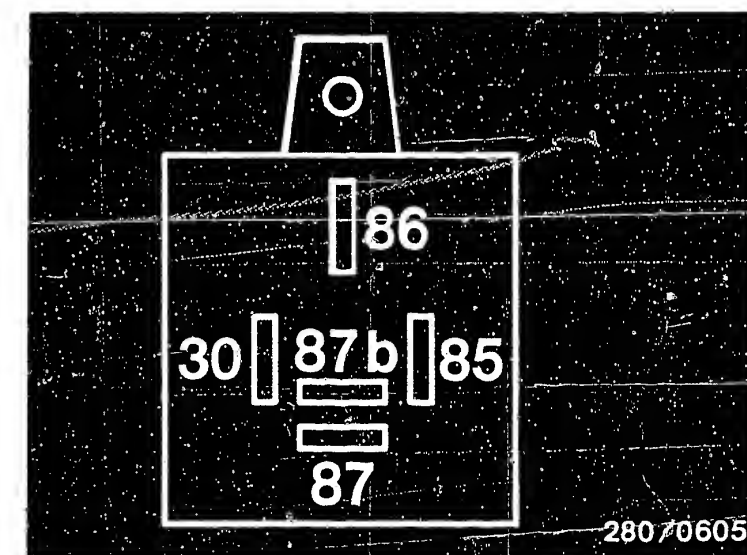
Installation Position of Components:

Injection relay: in central-electrics box under fuel tank



Top view of control-unit plug

Injection relay
(top view of connection base)



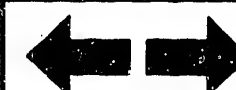
D 12

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



D 13

Test Chart for Universal Test Adapter
BMW Motorcycle K 100



Testing with the universal test adapter is now completed.

It is now necessary to perform the fuel pressure test. If a fault is detected during a test, the test must be repeated after the fault has been eliminated.

The fuel pressure test is described on Coordinates D15 ... E16.



FUEL PRESSURE TEST

Electric fuel pump (in-tank pump) operating?

Listen.

no

• Check power supply to in-tank pump

- measure voltage at disconnected plug (top picture - arrow). Ignition "ON" and start: set value min. 12 V (negative lead = brown, positive lead = green/white). If voltage present, in-tank pump defective, replace.

Removing the in-tank pump and filter:

- drain fuel tank.
- unscrew tank cap.
- unscrew in-tank pump/fuel filter and replace, if necessary.
- if no voltage present, check ground connection of in-tank pump (center picture - arrow).

Removing the fuel tank:

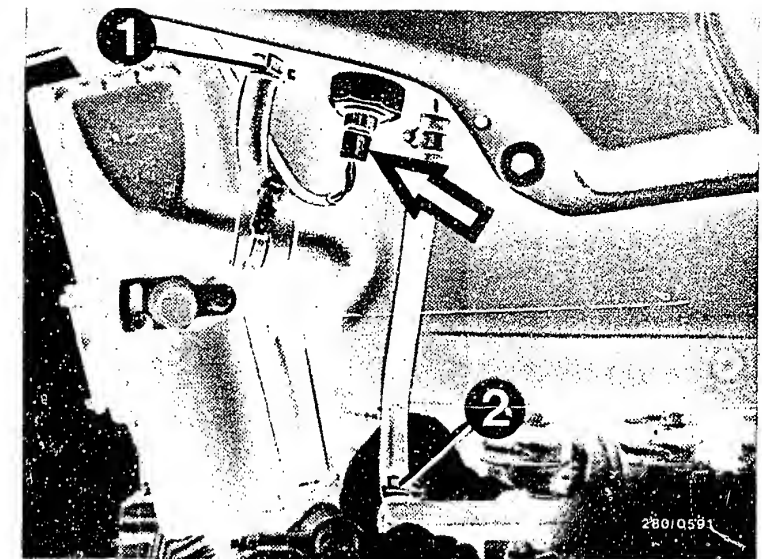
- take off left-hand battery cover.
- unhook radiator covers on left and right.
- hinge up seat bench.
- remove fuel tank.

Fault not yet remedied?

yes

Continued on E7/E8

Continued on E3/E4



E1

Fuel Pressure Test
BMW Motorcycle K 100



E2

Fuel Pressure Test
BMW Motorcycle K 100



Fuel Pressure Test (continued)

• Check injection relay

Removing the central-electrics box:

- take off left-hand battery cover.
- unhook radiator covers on left and right.
- hinge up seat bench.
- remove fuel tank.
- remove cover plate from central-electrics box.
- disconnect plug from timing-advance unit (top picture).

Testing:

Connect an auxiliary ground lead to term. 85 (injection relay) and start. In-tank pump must operate. If pump operates, check lead from term. 85 (injection relay) to timing-advance unit term. 7 for continuity (set value approx. 0 Ω)

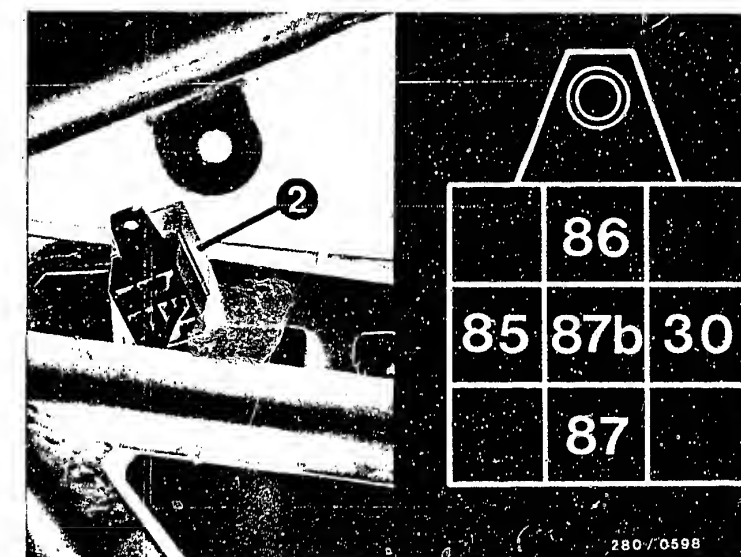
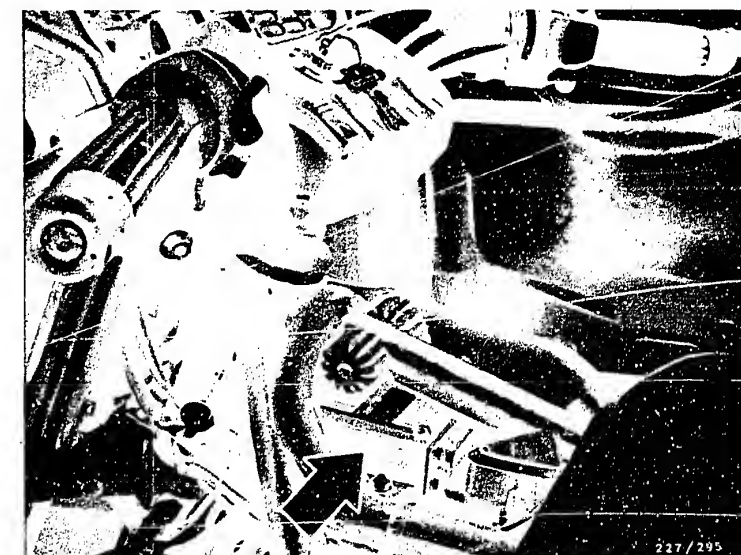
Check ground lead (bottom picture - arrow) of timing-advance unit term. 1 to central ground (set value approx. 0 Ω).

Leads O.K.? Fault remedied?

yes

Continued on E7/E8

Continued on E5/E6



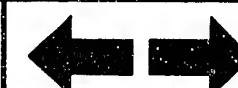
E3

Fuel Pressure Test
BMW Motorcycle K 100



E4

Fuel Pressure Test
BMW Motorcycle K 100



Fuel Pressure Test (continued)

yes

If not, check lead to positive battery terminal from term. 30 (injection relay) for open circuit (set value approx. 0 Ω). Disconnect positive lead to battery for testing. After testing, reconnect. Remove auxiliary ground from term. 85 on injection relay and connect plug on timing-advance unit.

- measure voltage at term. 86 (injection relay) (set value 8 ... 15 V).
To do this, ignition "ON" and start.

If no voltage, check fuse no. 1. If voltage present and in-tank pump still not operating:

- measure voltage at term. 87b (injection relay). (set value 8 ... 15 V).
To do this, ignition "ON" and start.
Voltage O.K.?

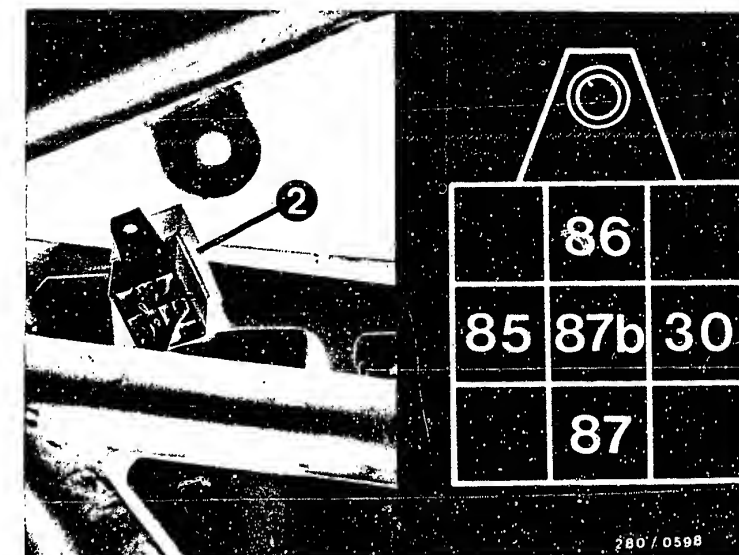
If not, replace injection relay.

• Check pump fuse

Pump fuse (in fuse box no. 6) defective/check positive lead to in-tank pump for continuity (set value approx. 0 Ω).

Continued on E7/E8

Continued on E7/E8



2=injection relay

1=pump fuse
(fuel pump)



E5

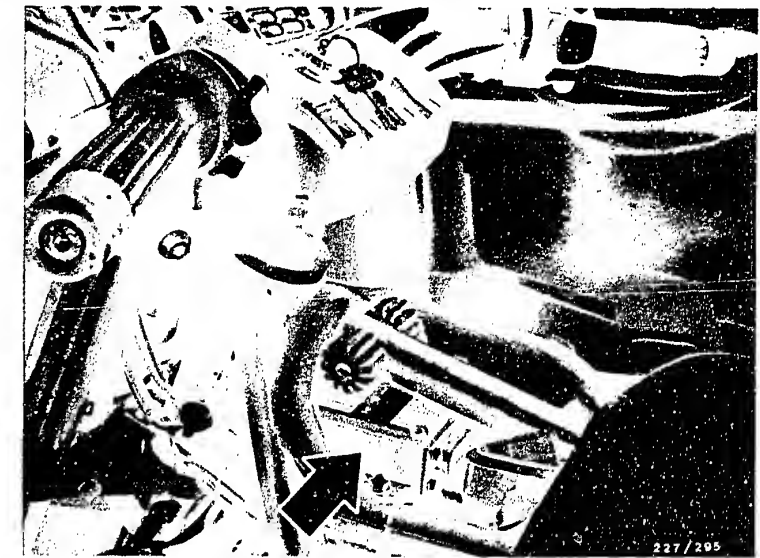
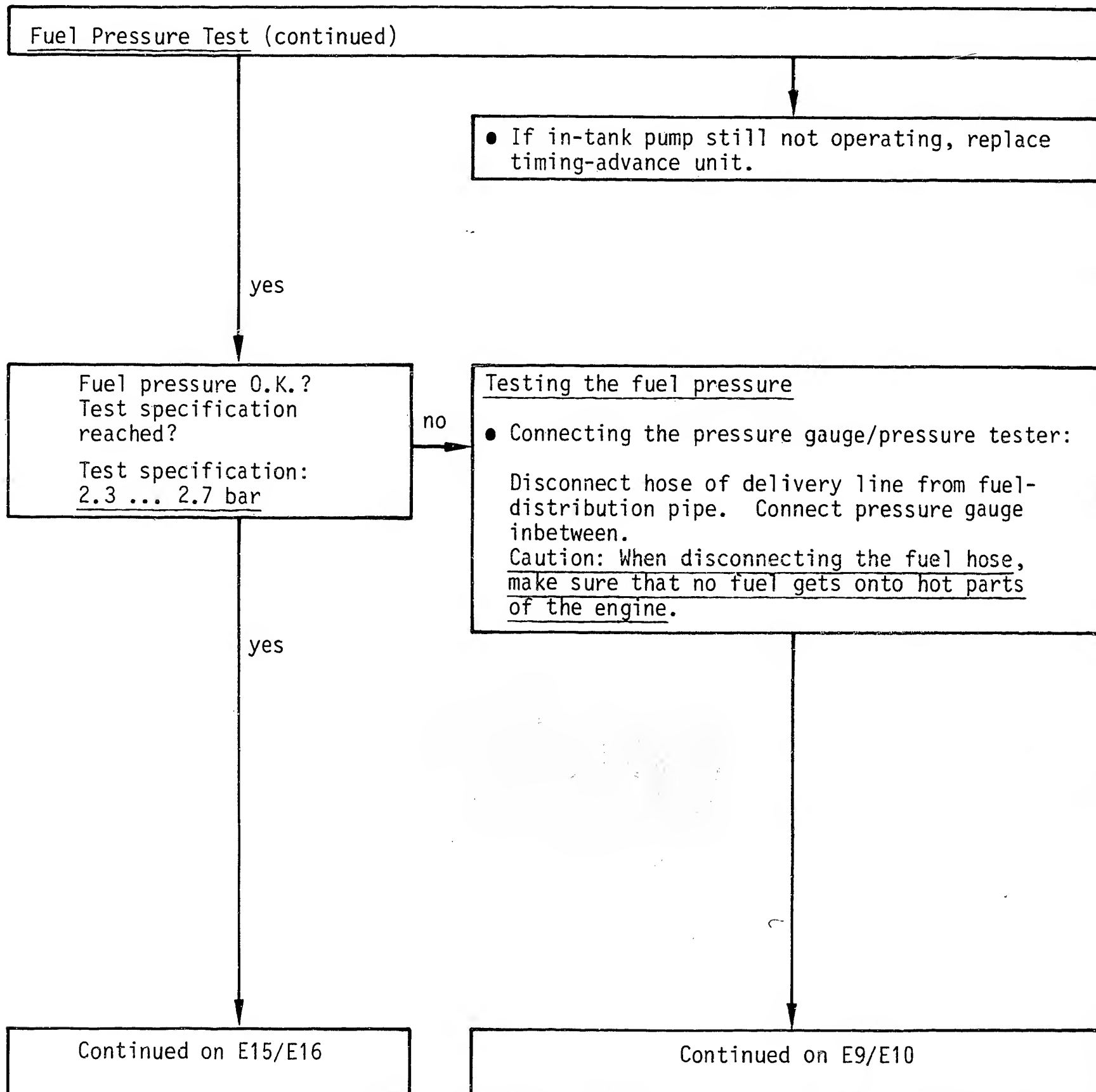
Fuel Pressure Test
BMW Motorcycle K 100



E6

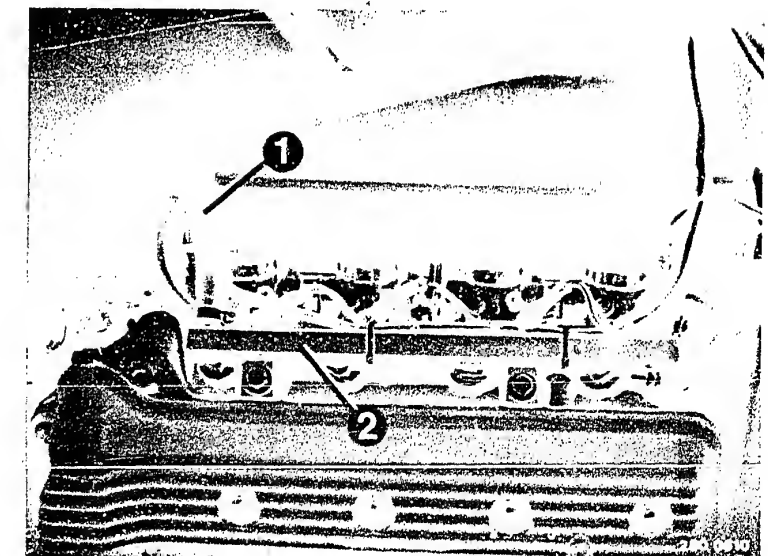
Fuel Pressure Test
BMW Motorcycle K 100





Arrow = timing-advance unit

1=fuel delivery line
2=fuel-distribution pipe



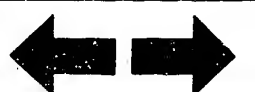
E7

Fuel Pressure Test
BMW Motorcycle K 100



E8

Fuel Pressure Test
BMW Motorcycle K 100



Fuel Pressure Test (continued)

• Bridging the Safety Circuit

Remove the following components:

- Take off left-hand battery cover.
- Unhook radiator covers on left and right.
- Hinge up seat bench.
- Remove fuel tank.
- Remove cover plate from central-electrics box.

Disconnect injection relay. Insert jumper into connection base between term. 87b and term. 30. In-tank pump must operate.

Fuel Pressure

Test Specification: 2.3...2.7 bar

Remove jumper and connect injection relay. Let engine idle.

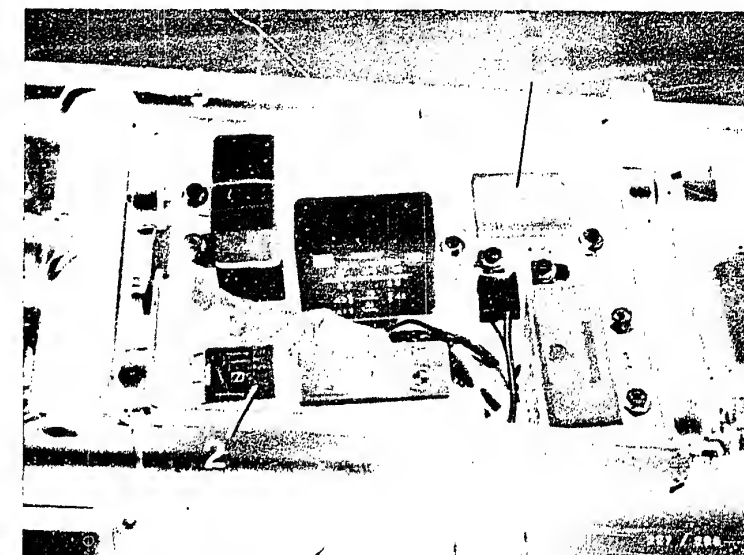
Fuel Pressure

Test Specification: approx. 2.0 bar

yes

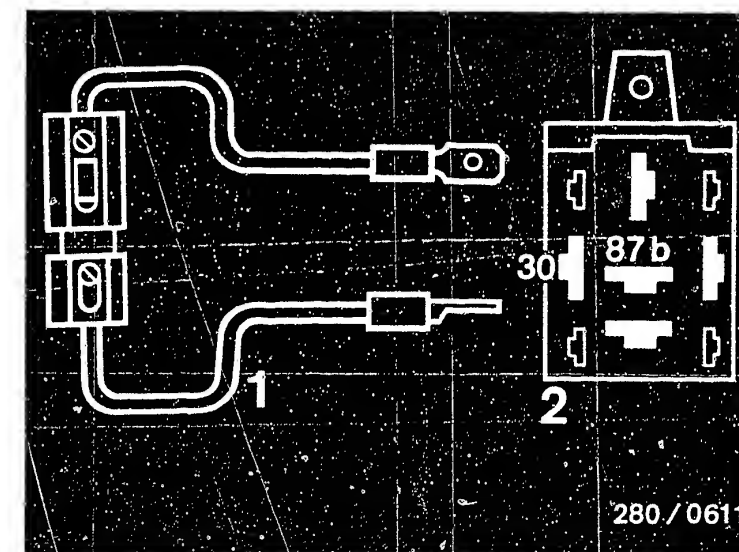
Continued on E15/E16

Continued on E11/E12



2=Injection relay

1=Jumper with fuse holder and 10A fuse (user-fabricated)
2=Top view of connection base



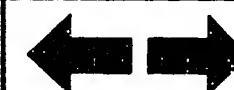
E9

Fuel Pressure Test
BMW Motorcycle K 100



E10

Fuel Pressure Test
BMW Motorcycle K 100



Fuel Pressure Test (continued)

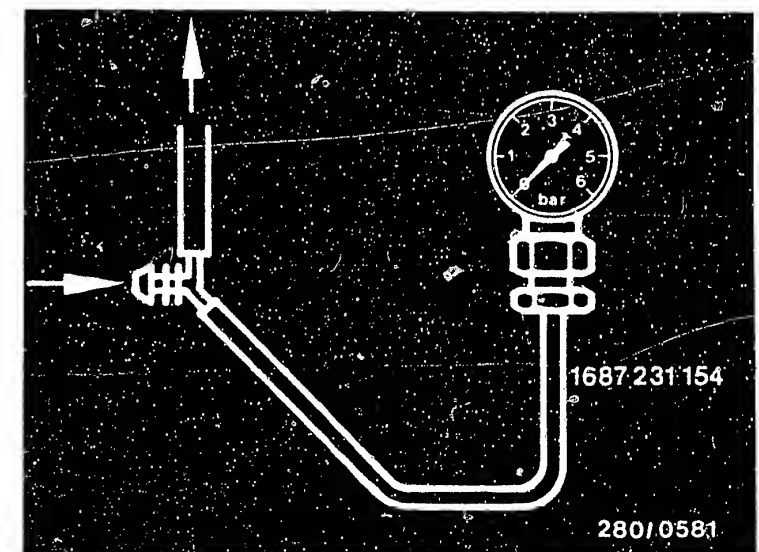
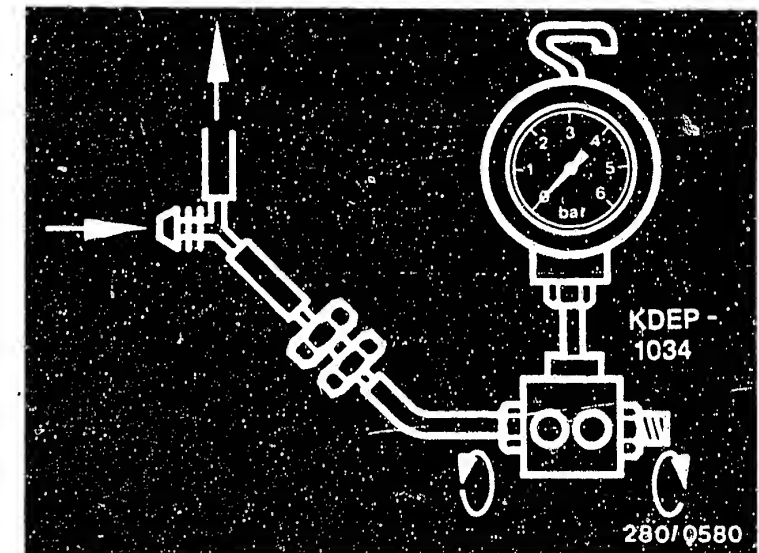
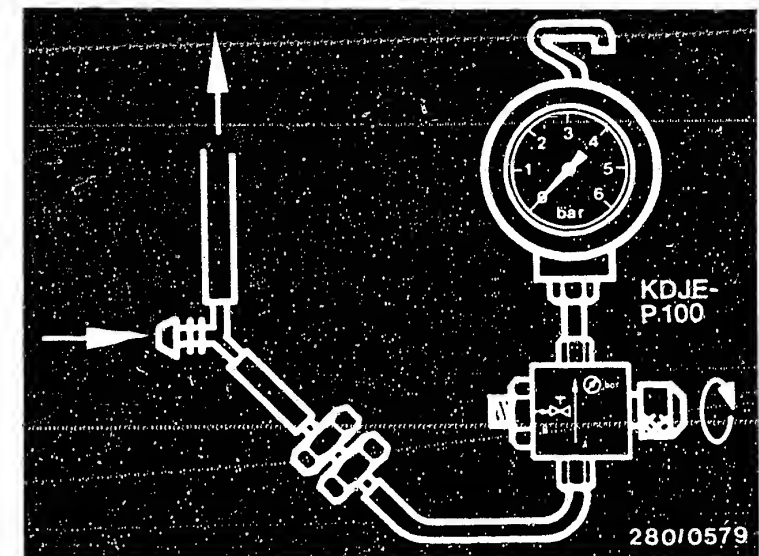
• Testing the Fuel Pressure

Connect connections of pressure tester into the fuel delivery line. If using pressure tester KDJE-P 100, the valve screw must be closed; if using KDEP 1034, only the right-hand one needs closing. The end of the hose is plugged onto the fuel-distribution pipe and the free Y-connection is plugged onto the fuel delivery hose. Make sure there are no leaks.

yes

Continued on E15/E16

Continued on E13/E14



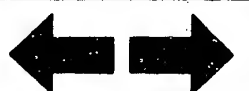
E11

Fuel Pressure Test
BMW Motorcycle K 100



E12

Fuel Pressure Test
BMW Motorcycle K 100



Fuel Pressure Test (continued)

• Testing the Pressure Regulator

Fuel pressure

Test Specification: 2.3...2.7 bar

Fuel pressure of 2.3 bar not reached:

Slowly pinch off fuel return line.

Caution: Do not load pressure gauge above 6 bar.

If pressure rises above 4 bar, replace pressure regulator.

The pressure regulator is connected to the fuel-distribution pipe by means of a hose-piece.

- Fuel delivery line, fuel filter or pressure damper clogged.
- Strainer in tank clogged.
- Corrosion in tank.

Fuel pressure of 2.7 bar exceeded:

- Fuel return line clogged or pinched.
- Replace pressure regulator.

yes

Continued on E15/E16



Arrow=Pressure Regulator

E13

Fuel Pressure Test
BMW Motorcycle K 100



E14

Fuel Pressure Test
BMW Motorcycle K 100



Fuel Pressure Test (continued)

Does fuel pressure remain almost constant after engine has been switched off?

no

The fuel pressure drops rapidly after the hot engine has been switched off.

- Check fuel system for leaks; fuel pressure 2.3...2.7 bar.
- Disconnect jumper and watch pressure gauge. After approx. 20 min. the fuel pressure must still be min. 1.0 bar.

If not:

- Check connections between components and fuel hoses/lines for leaks. (Arrows in picture).
- Pressure regulator (diaphragm).
- Injection valves (needle seat, valve not closing properly).
- In-tank pump (non-return valve leaking).
- Pressure damper or fuel filter leaking.

yes

Remove pressure gauge. Re-establish connection between fuel delivery line and fuel-distribution pipe.
Remove jumper and plug injection relay into connection base.
Caution: After testing, re-establish the original condition. The fuel pressure test is now completed.
If the fault has not been found or if further instructions on how to remedy the fault are required, continue in accordance with the trouble-shooting chart of your choice.
Detailed trouble-shooting chart (Coordinates C3...C9)
Direct trouble-shooting chart (Coordinates C5...C8)

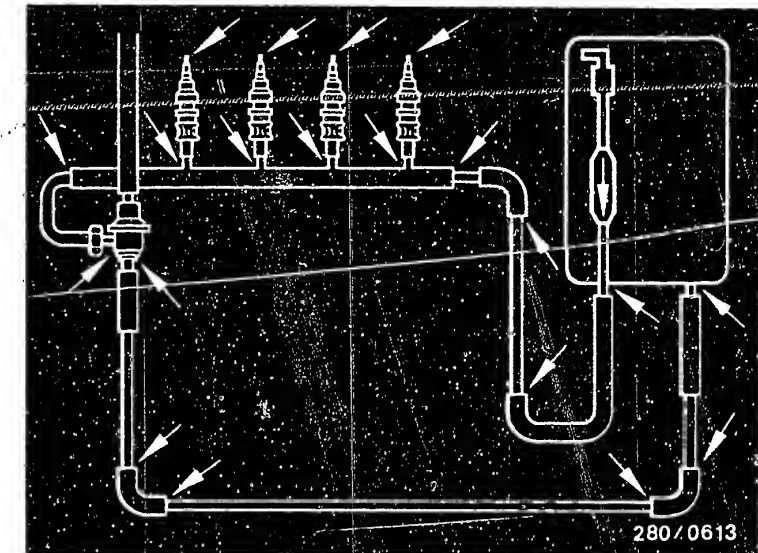


Diagram of Fuel Lines
Arrows indicate connections between hoses and components.

E15

Fuel Pressure Test
BMW Motorcycle K 100



E16

Fuel Pressure Test
BMW Motorcycle K 100



STARTING MOTOR OPERATES, ENGINE FAILS TO START OR STARTS ONLY WITH GREAT DIFFICULTY

Trouble-shooting program according to customer complaint

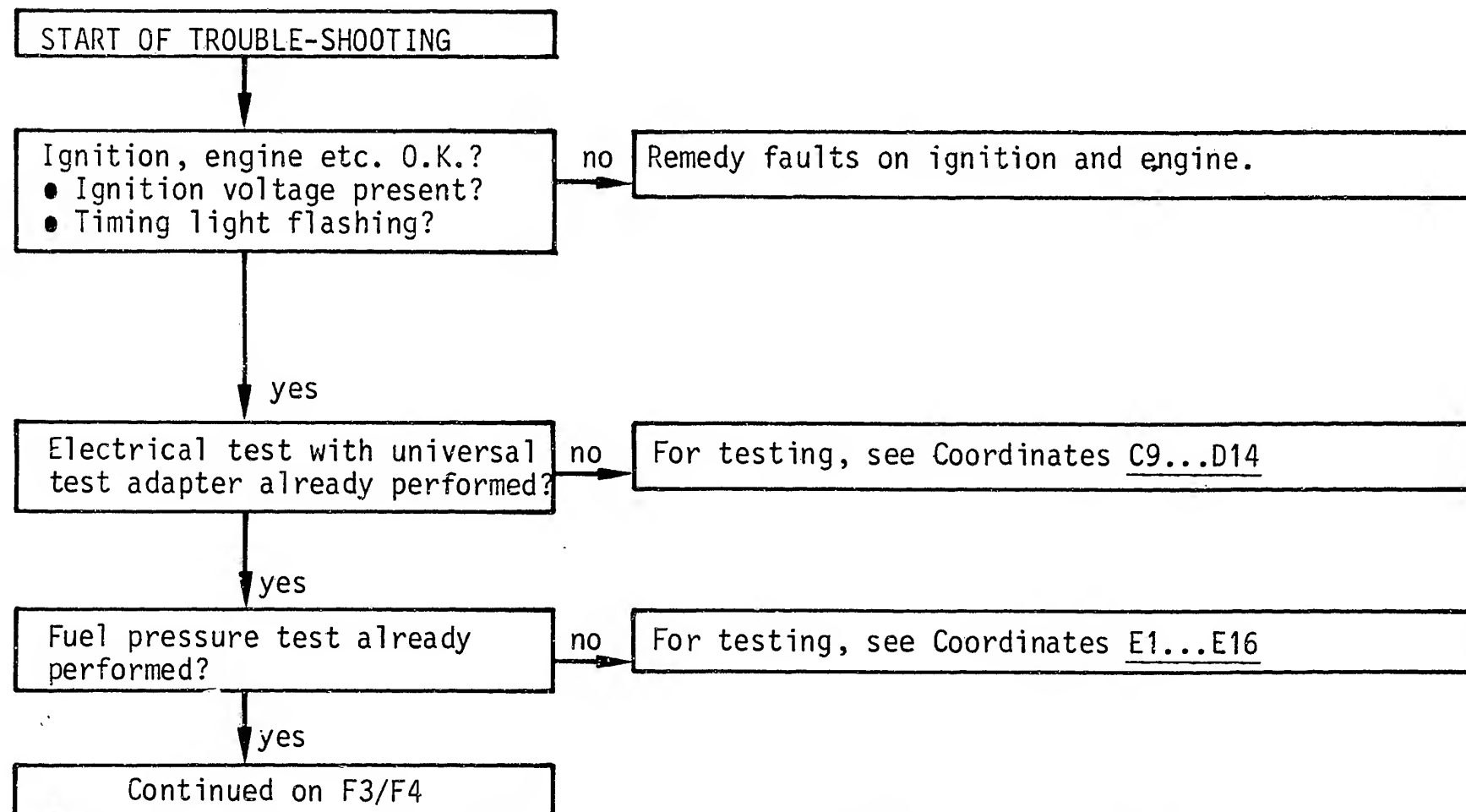
Procedure

The test is divided into 3 rows of boxes:

- The left-hand row contains the questions for the tests.
- The center row describes the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.



F1

Engine Fails to Start
BMW Motorcycle K 100



F2

Engine Fails to Start
BMW Motorcycle K 100



Starting motor operates, engine fails to start or starts only with great difficulty(cont)

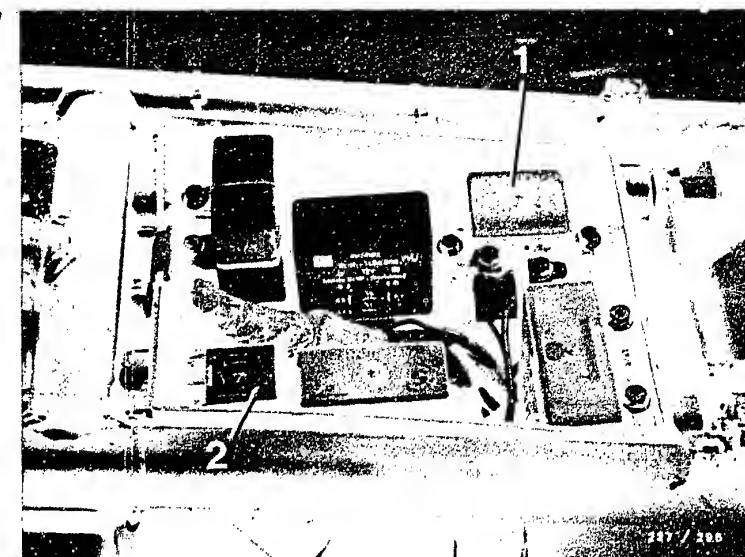
yes

Cold-start control O.K.?
(control unit function)

- Connect test lead between an injection valve.
- Disconnect plug from temperature sensor II (engine).
- Connect motortester/multimeter to test lead. (setting V, measuring range 10 V).
- Jump safety circuit (voltage supply to control unit).
- Disconnect term. 1 from both ignition coils (engine must not start).
- Crank engine.

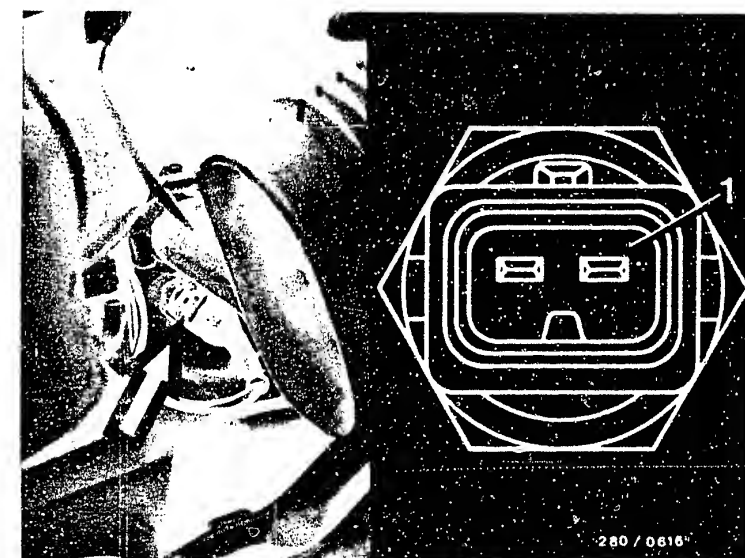
yes

Continued on F5/F6



2=Injection relay

Arrow=Temperature sensor II (engine)
Top view of plug of temperature
sensor for LE version (1)



F3

Engine Fails to Start
BMW Motorcycle K 100



F4

Engine Fails to Start
BMW Motorcycle K 100



Starting motor operates, engine fails to start or starts only with great difficulty(cont)

yes

Does voltage across injection valve drop during cranking from approx. 7V to approx. 0.5V? (with engine at normal operating temperature and with NTC II plug connected the initial voltage is less than 0.5V). After testing, re-establish the original condition.

no

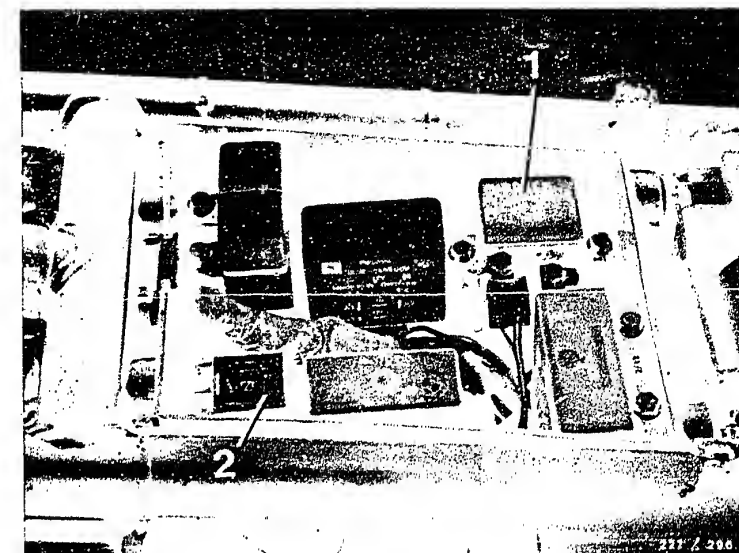
Functional Test:

- Take off battery cover.
- Hinge up seat bench. Remove fuel tank.
- Disconnect injection relay.
- Insert jumper into connection base between term. 30 and term. 87. Check power supply to control unit and solenoid-operated injection valves.

yes

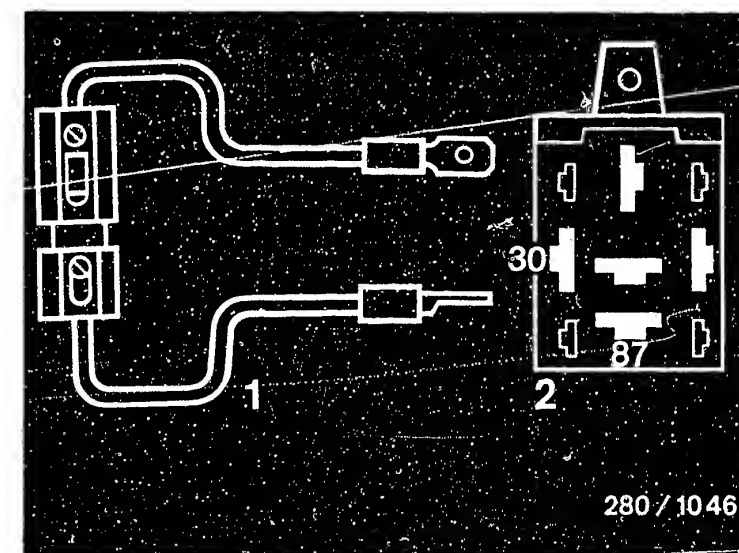
Continued on F11/F12

Continued on F7/F8



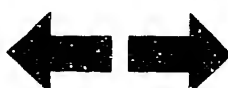
2=Injection relay

1=Jumper with fuse holder and 10 A fuse (user-fabricated)
2=Top view of connection base



F5

Engine Fails to Start
BMW Motorcycle K 100



F6

Engine Fails to Start
BMW Motorcycle K 100



Starting motor operates, engine fails to start or starts only with great difficulty(cont)

Disconnect lead term. 1 from both ignition coils
(unscrew cover).
Caution: Do not mix up term. 1 when re-connecting
later.
Engine must not start when starting motor is
operated.



Arrows = Connection -
Terminal 1

yes

Continued on F11/F12

Continued on F9/F10

F7

Engine Fails to Start
BMW Motorcycle K 100



F8

Engine Fails to Start
BMW Motorcycle K 100



Starting motor operates, engine fails to start or starts only with great difficulty(cont.)

- Connect 2-pole adapter lead 1 684 463 093 between an injection valve and its electrical connecting lead.
- Connect multimeter to free measuring poles. Measuring range approx. 10 V.
- Disconnect plug from temperature sensor II (engine).

Measuring:

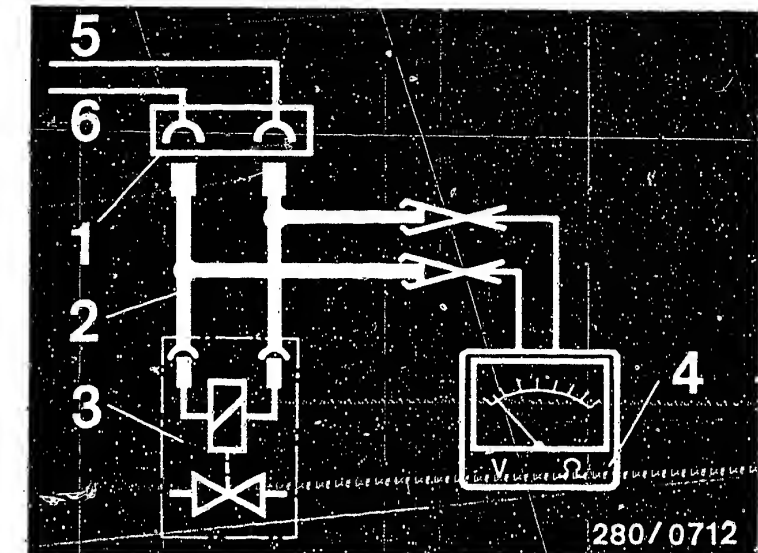
- Start engine.
- Voltage reading drops from initially approx. 7 V within approx. 15 s cranking time to approx. 0.5 V.
If voltage values not reached, replace control unit.
- Wait approx. 1 minute before repeating voltage test.
- Connect plug to temperature sensor. If engine at normal operating temperature, start. Voltage reading less than 0.5 V. If not, replace temperature sensor II (double NTC).

Caution:

After testing, re-establish the original condition.

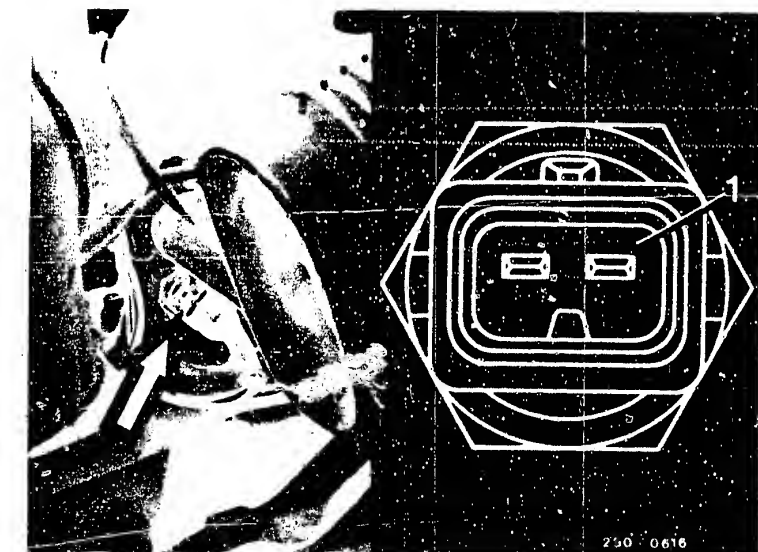
yes

Continued on F11/F12



- 1=Connector of injection valve lead
- 2=Test lead 1 684 463 093
- 3=Injection valve
- 4=Multimeter/motortester
- 5=From injection relay term. 87
- 6=From control unit term. 12

Arrow=Temperature Sensor II (engine)
Top view of plug (1)



F9

Engine Fails to Start
BMW Motorcycle K 100



F10

Engine Fails to Start
BMW Motorcycle K 100



Starting motor operates, engine fails to start or starts only with great difficulty(cont)

yes

Air-flow sensor mechanically and electrically O.K.?

Resistance values within tolerance?
Between term. 8 and term. 9:
160...300 Ω

Between term. 7 and term. 5
(deflect air-flow sensor flap):
60...1000 Ω

60...1000 Ω

yes

Continued on F13/F14

no

Testing:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter.

● Checking the air-flow sensor flap for freedom of movement

Open air-flow sensor flap by hand. It must be possible to move the sensor flap with uniform ease from its fully open position to its fully closed position. When released, the sensor flap must close again fully by itself. Sensor flap must not catch when being opened.

● Mechanical test of air-flow sensor

For further testing, the air-flow sensor must be removed from the top part of the air filter (loosen 2 hexagon-socket-head capscrews and loosen hose to intake manifold). Watch for signs of rubbing. Clean air-flow sensor if very dirty inside and rub out with a lint-free cloth. If there are signs of rubbing, replace air-flow sensor.

● Sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. Replace air-flow sensor.

● Testing the resistances

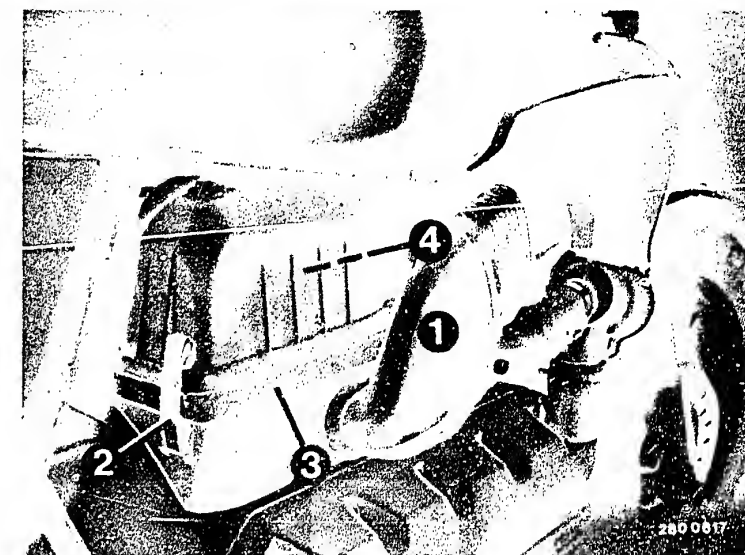
Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: 160...300 Ω

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Deflect sensor flap.

Test specification: 60...1000 Ω

Continued on F13/F14



1=Air guide
2=Snap-on fastener
3=Air filter
4=Air-flow sensor

Opening the air-flow sensor flap



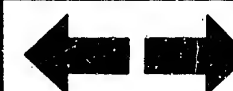
F11

Engine Fails to Start
BMW Motorcycle K 100



F12

Engine Fails to Start
BMW Motorcycle K 100



Starting motor operates, engine fails to start or starts only with great difficulty(cont.)

yes

Caution: After testing is completed, the air-flow sensor must be installed again correctly. Re-establish the original condition.

All hose lines correctly connected, not kinked or damaged? Visual examination.

Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

- Check whether hoses of air-intake system and of fuel line system are correctly connected, not kinked or damaged. If necessary, replace hoses. Remedy leaks by means of new seals or by re-tightening the connecting screws.

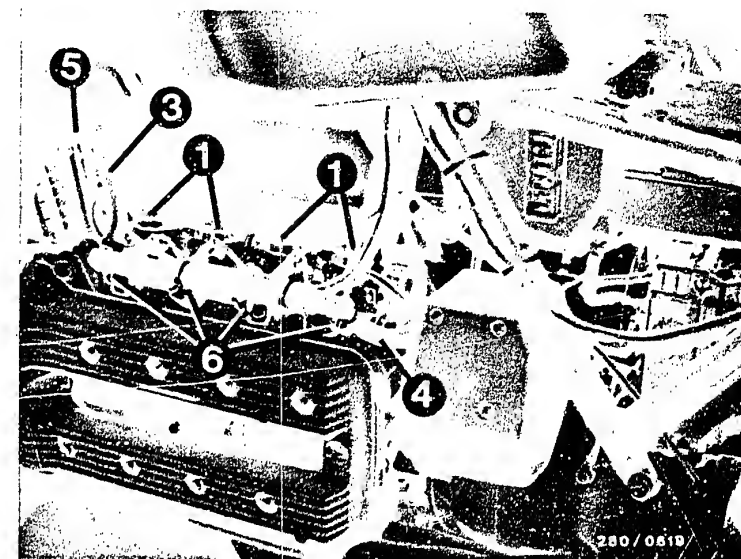
• Leak Test:

Seal off exhaust tail pipe. Disconnect air guide to air filter. Unscrew hose between air-flow sensor and intake manifold at air-flow sensor and seal off with a disc (user-fabricated). The disc should have a hole through which air (0.3 bar) can be blown in. Open throttle valve fully. Brush or spray all joints with soapy water. Leaks may also occur due to a defective cap seal on the oil filler neck etc.

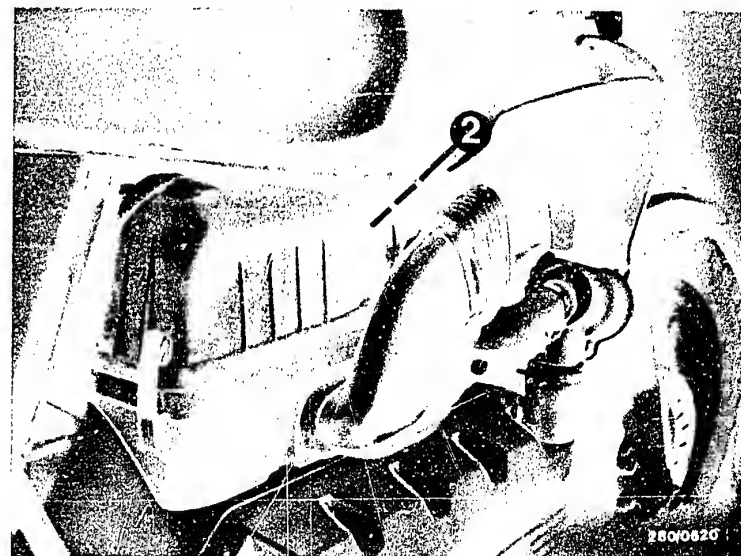
Bubbling or foaming indicates a leak. Caution: After testing, re-establish the original condition.

yes

Continued on F15/F16



- 1=Throttle-valve assembly
- 2=Hose between air-flow sensor and intake manifold
- 3=Hose between fuel tank and fuel-distribution pipe
- 4=Hose from fuel-distribution pipe to pressure regulator
- 5=Hose between pressure regulator and fuel tank
- 6=Injection valves



F13

Engine Fails to Start
BMW Motorcycle K 100



F14

Engine Fails to Start
BMW Motorcycle K 100



Starting motor operates, engine fails to start or starts only with great difficulty(cont.)

yes

Trouble-shooting program
completed for customer complaint

"Starting motor operates, engine
fails to start or starts only
with great difficulty".

Fault remedied?

no

Further Possibilities:

- Customer complaint incorrectly diagnosed.
(See Coordinates C5...C8). If the fault has
not been detected with the "direct trouble-
shooting chart", see "detailed trouble-shooting
chart" (Coordinates C3/C4).
- Engine not mechanically O.K. (compression,
valve setting, valve timing, worn camshaft).

F15

Engine Fails to Start
BMW Motorcycle K 100



F16

Engine Fails to Start
BMW Motorcycle K 100



ENGINE STARTS BUT THEN DIES

Trouble-shooting program according to customer complaint

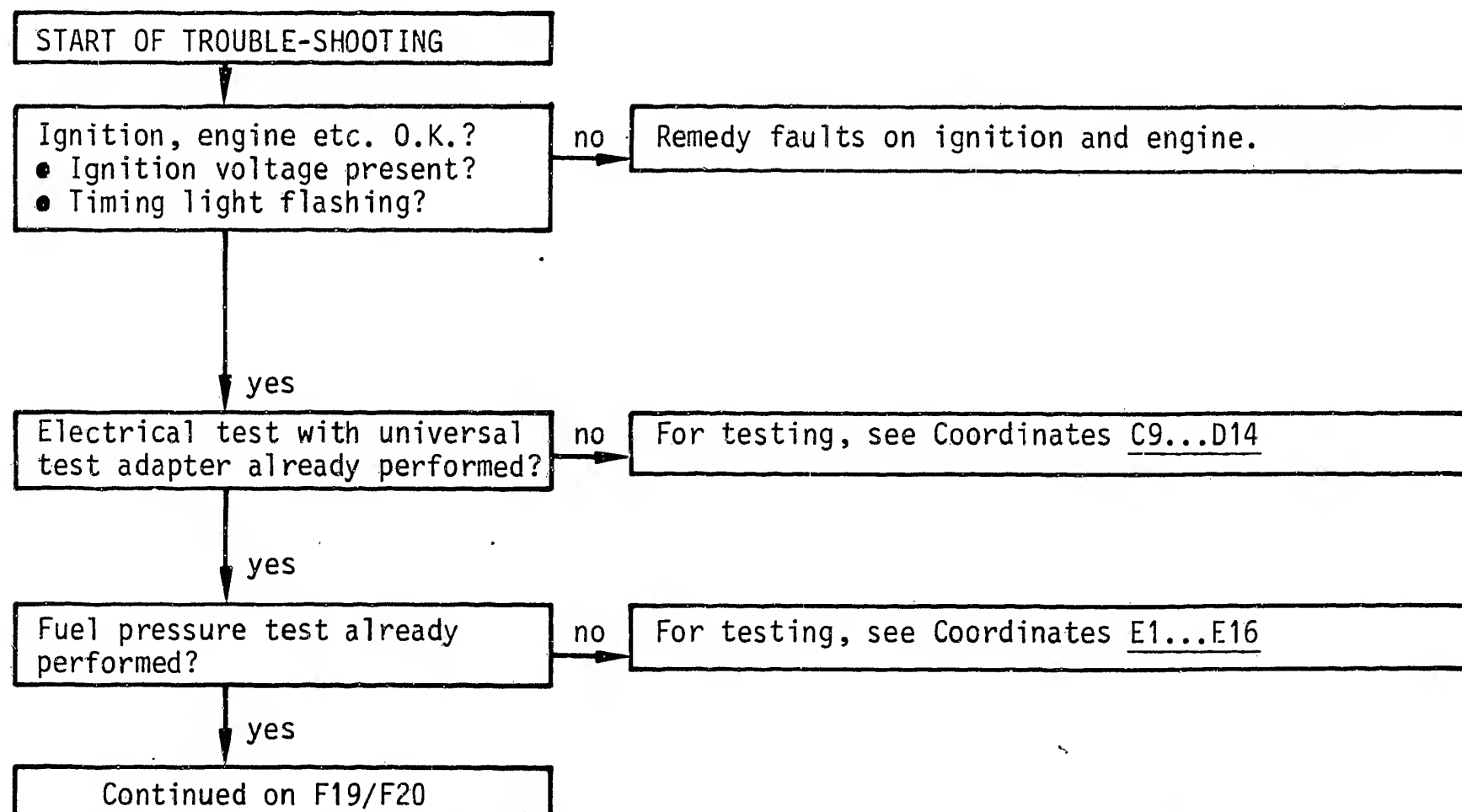
Procedure

The test is divided into 3 rows of boxes:

- The left-hand row contains the questions for the tests.
- The center row describes the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.



F17

Engine Starts But Then Dies
BMW Motorcycle K 100



F18

Engine Starts But Then Dies
BMW Motorcycle K 100



Engine Starts But Then Dies (continued)

yes

Throttle-valve correctly
adjusted?

no

• Choke Adjustment

Starting the engine when cold and warm:
Set the choke operating lever as a function of
engine/ambient temperature.

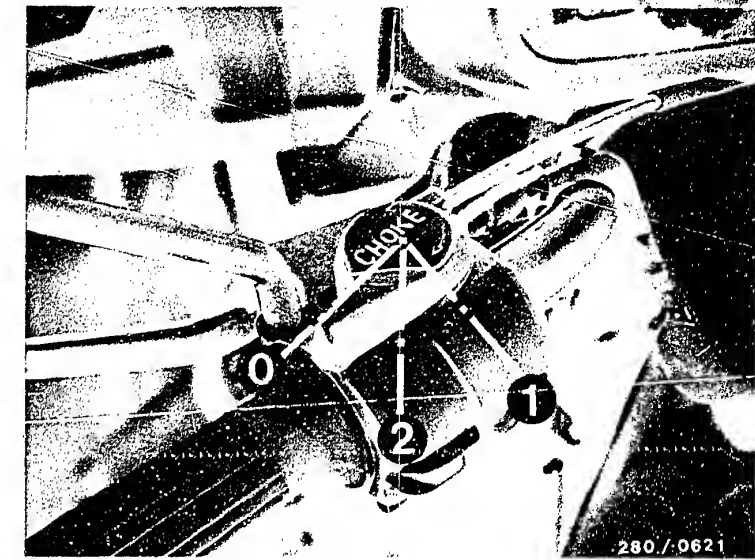
- Setting 1 = below 0°C
- Setting 2 = between 0° and 10°C
- Setting 0 = with engine warm/ambient
temperature approx. 12°C or
above.

Throttle grip must remain closed. Return
choke gradually to "0" setting depending on
smooth running of engine.

yes

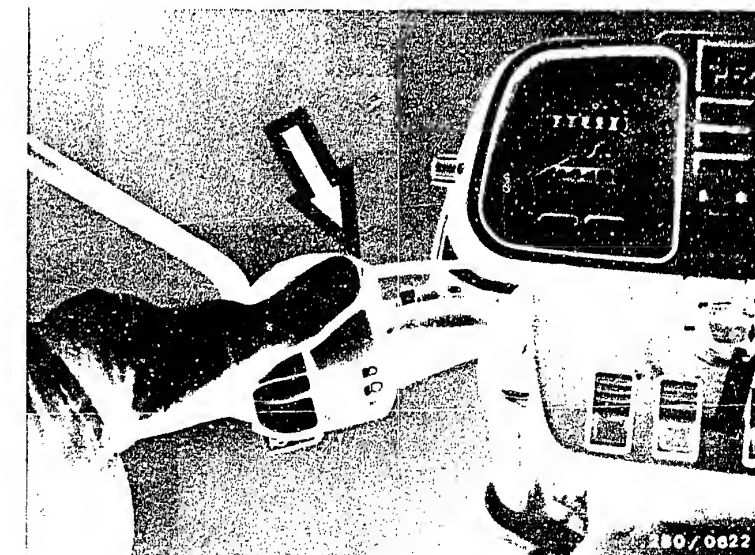
Continued on F23/F24

Continued on F21/F22



0=Setting when engine warm
1=Setting for temperatures below 0°C
2=Setting for temperatures between
0° and 10°C

Starting position for temperatures
below 0°C.
Arrow = Choke



F 19

Engine Starts But Then Dies
BMW Motorcycle K 100



F 20

Engine Starts But Then Dies
BMW Motorcycle K 100



Engine Starts But Then Dies (continued)

yes

• Synchronizing the Throttle-valves:

When checking the vacuum in the 4 intake ports, the individual pressures are compared and, if necessary, adjusted.

Test setup:

Connect vacuum tester e.g. ETT 007.00 to the individual throttle-valve nipples according to operating instructions.

Start engine and run at idle. Read off value on instrument and write down. Perform test in same manner on all 4 throttle-valves.

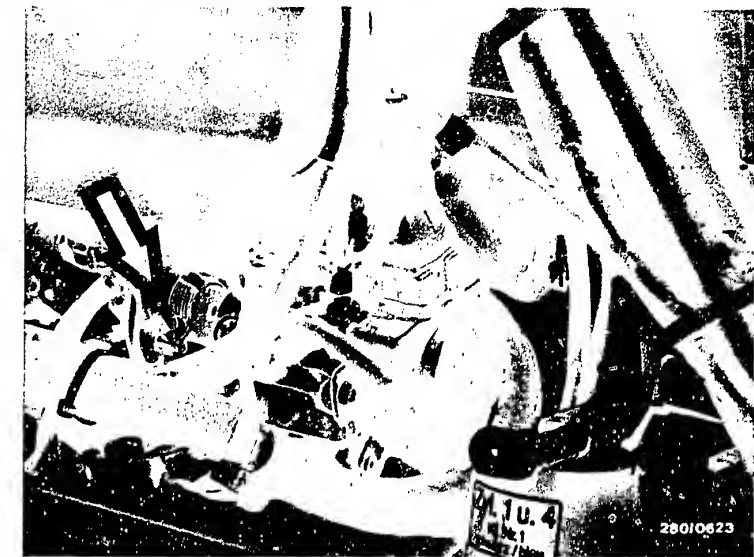
Test specification:

Equal pressure drop across all 4 throttle-valves.
Max. deviation from average value: ± 20 mbar.
(Adjustable by means of the bypass-air screws).

It is important that there is the same pressure drop across all 4 throttle valves.

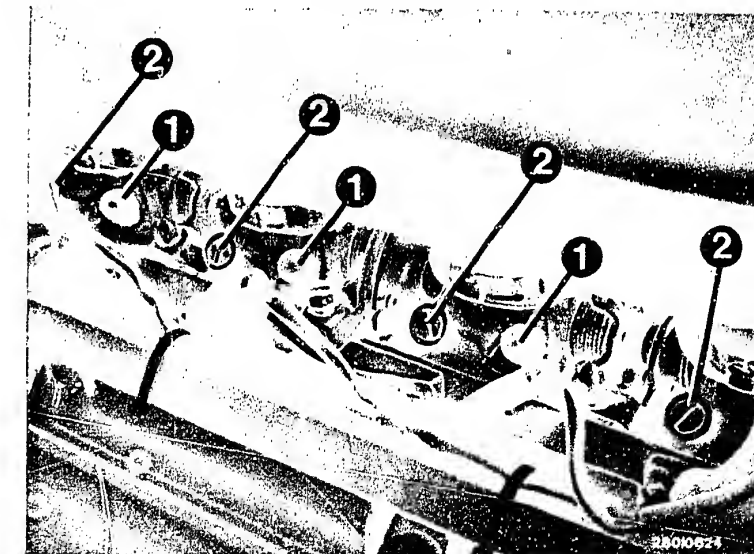
Caution: After testing, re-establish the original condition.

Continued on F23/F24



Arrow=Throttle-valve stop screw

1=Throttle-valve nipple
2=Bypass-air screw



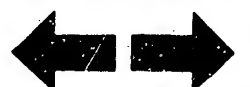
F21

Engine Starts But Then Dies
BMW Motorcycle K 100



F22

Engine Starts But Then Dies
BMW Motorcycle K 100



Engine Starts But Then Dies (continued)

Solenoid-operated injection valves leak-tight?

no

● Leak-test on Injection Valves

- Removing the fuel-distribution pipe:
Loosen fastening screws. Pull all 4 injection valves simultaneously and carefully out of the cylinder head.

Build up the fuel pressure:
Jump the safety circuit.

Caution:

Make sure that no fuel gets onto hot parts of the engine.

Test Specification:

Within 60 sec. no drop may fall from the mouth of the injection valve. If incorrect, replace injection valve.

Disconnect electrical connection. Carefully slide holding clamp out of groove and pull injection valve out of fuel-distribution pipe.

Caution: Catch any escaping fuel. Do not allow to drip onto hot parts of the engine.

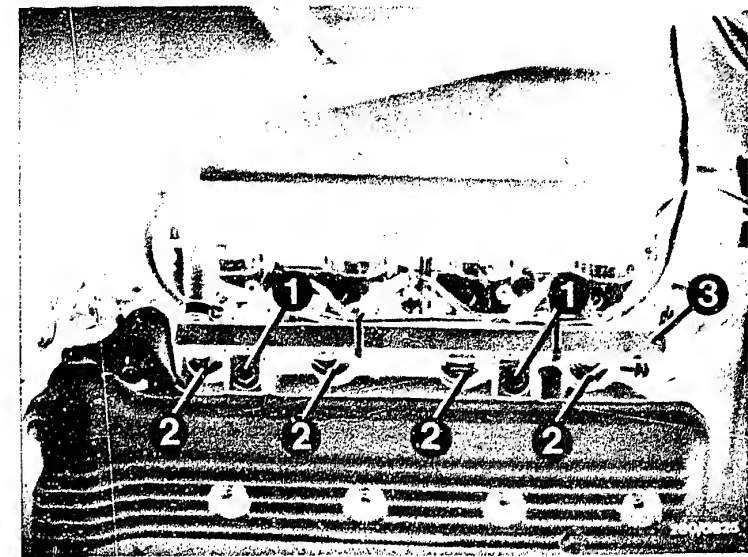
Warning:

Before installing, grease both O-rings only lightly (silicone grease F T 2 v 1). The other parts of the injection valves must remain grease-free.

Caution: After testing, re-establish the original condition.

yes

Continued on G1/G2



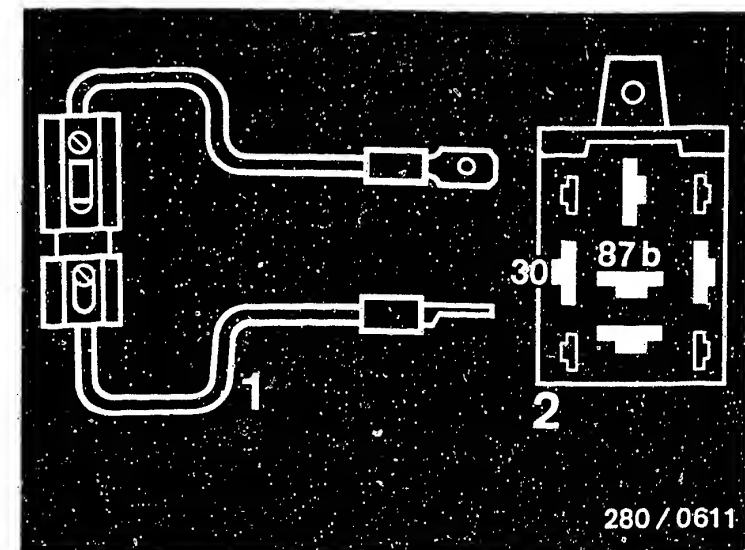
1=Fastening screws

2=Injection valve

3=Fuel-distribution pipe

1=Jumper with fuse holder and 10A fuse (user-fabricated)

2=Top view of connection base



280 / 0611

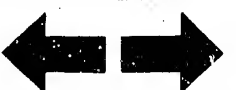
F23

Engine Starts But Then Dies
BMW Motorcycle K 100



F24

Engine Starts But Then Dies
BMW Motorcycle K 100



Engine Starts But Then Dies (continued)

yes

All hose lines correctly connected, not kinked or damaged? Visual examination.

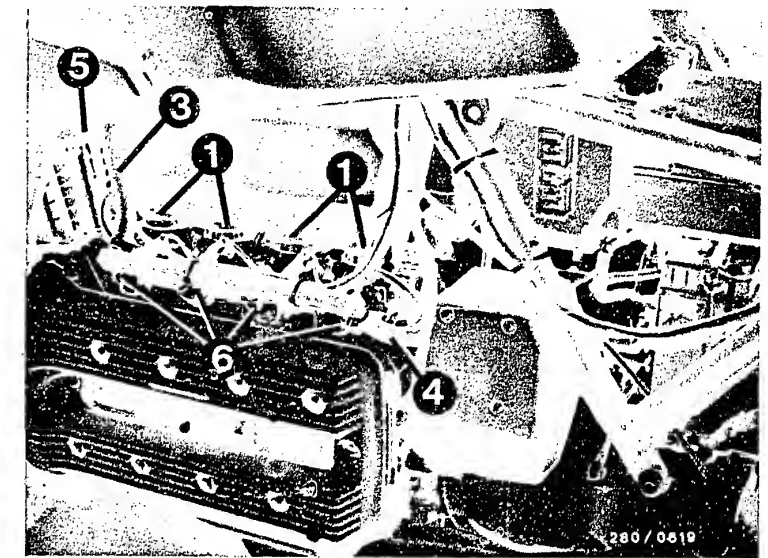
Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

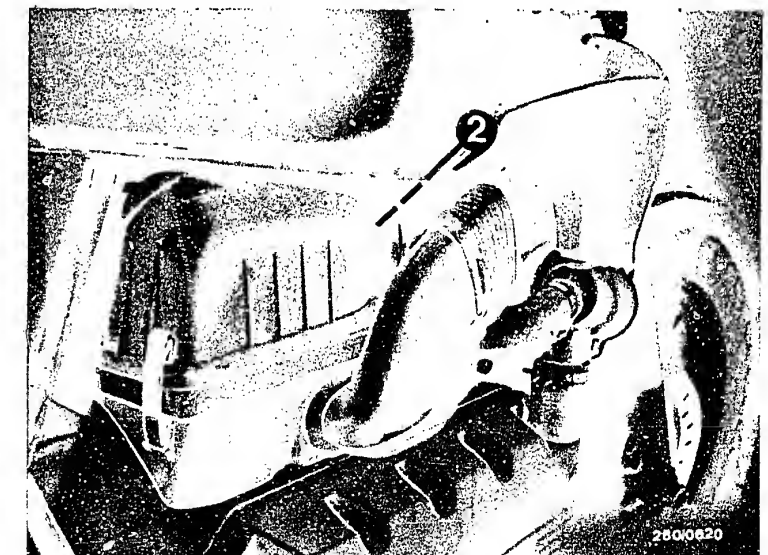
- Check whether hoses of air-intake system and of fuel line system are correctly connected, not kinked or damaged. If necessary, replace hoses. Remedy leaks by means of new seals or by re-tightening the connecting screws.
- Leak Test:
Seal off exhaust tail pipe. Disconnect air guide to air filter. Unscrew hose between air-flow sensor and intake manifold at air-flow sensor and seal off with a disc (user-fabricated). The disc should have a hole through which air (0.3 bar) can be blown in. Open throttle valve fully. Brush or spray all joints with soapy water. Leaks may also occur due to a defective cap seal on the oil filter neck etc. Bubbling or foaming indicates a leak.
Caution: After testing, re-establish the original condition.

yes

Continued on G3/G4



- 1=Throttle-valve assembly
2=Hose between air-flow sensor and intake manifold
3=Hose between fuel tank and fuel-distribution pipe
4=Hose from fuel-distribution pipe to pressure regulator
5=Hose between pressure regulator and fuel tank
6=Injection valves



G1

Engine Starts But Then Dies
BMW Motorcycle K 100



G2

Engine Starts But Then Dies
BMW Motorcycle K 100



Engine Starts But Then Dies (continued)

yes

Trouble-shooting program completed for customer complaint

"engine starts but then dies"

Fault remedied?

no

Further Possibilities:

- Customer complaint incorrectly diagnosed. (See Coordinates C5...C8). If the fault has not been detected with the "direct trouble-shooting chart", see "detailed trouble-shooting chart" (Coordinates C3/C4).
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).

G3

Engine Starts But Then Dies
BMW Motorcycle K 100



G4

Engine Starts But Then Dies
BMW Motorcycle K 100



ROUGH ENGINE IDLE; INCORRECT IDLE SPEED

Trouble-shooting program according to customer complaint

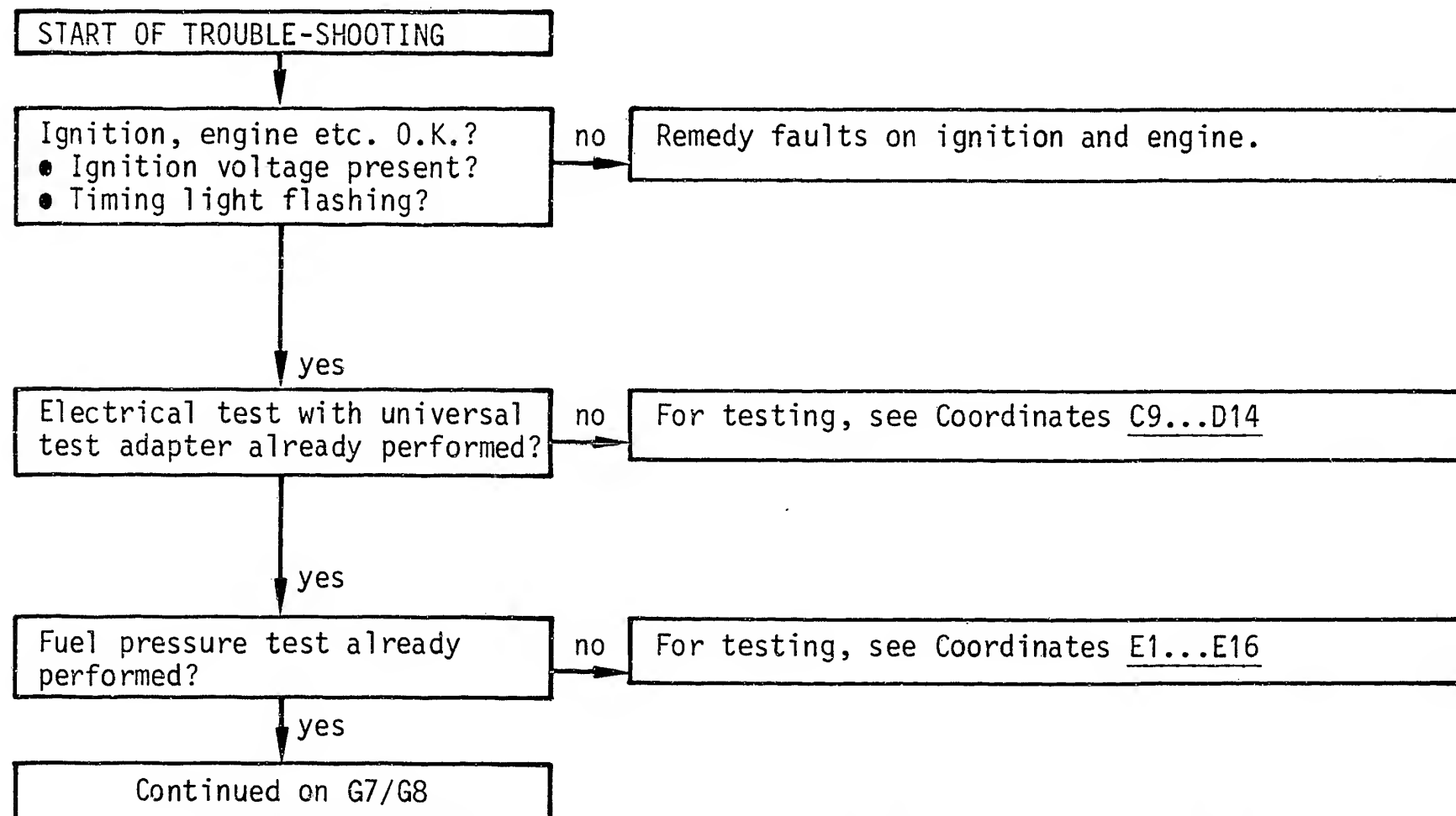
Procedure

The test is divided into 3 rows of boxes:

- The left-hand row contains the questions for the tests.
- The center row describes the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.



G5

Rough Idle
BMW Motorcycle K 100

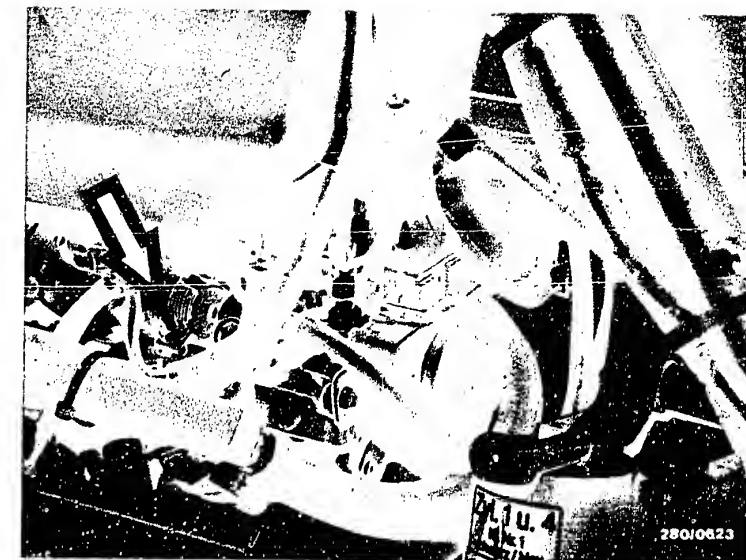
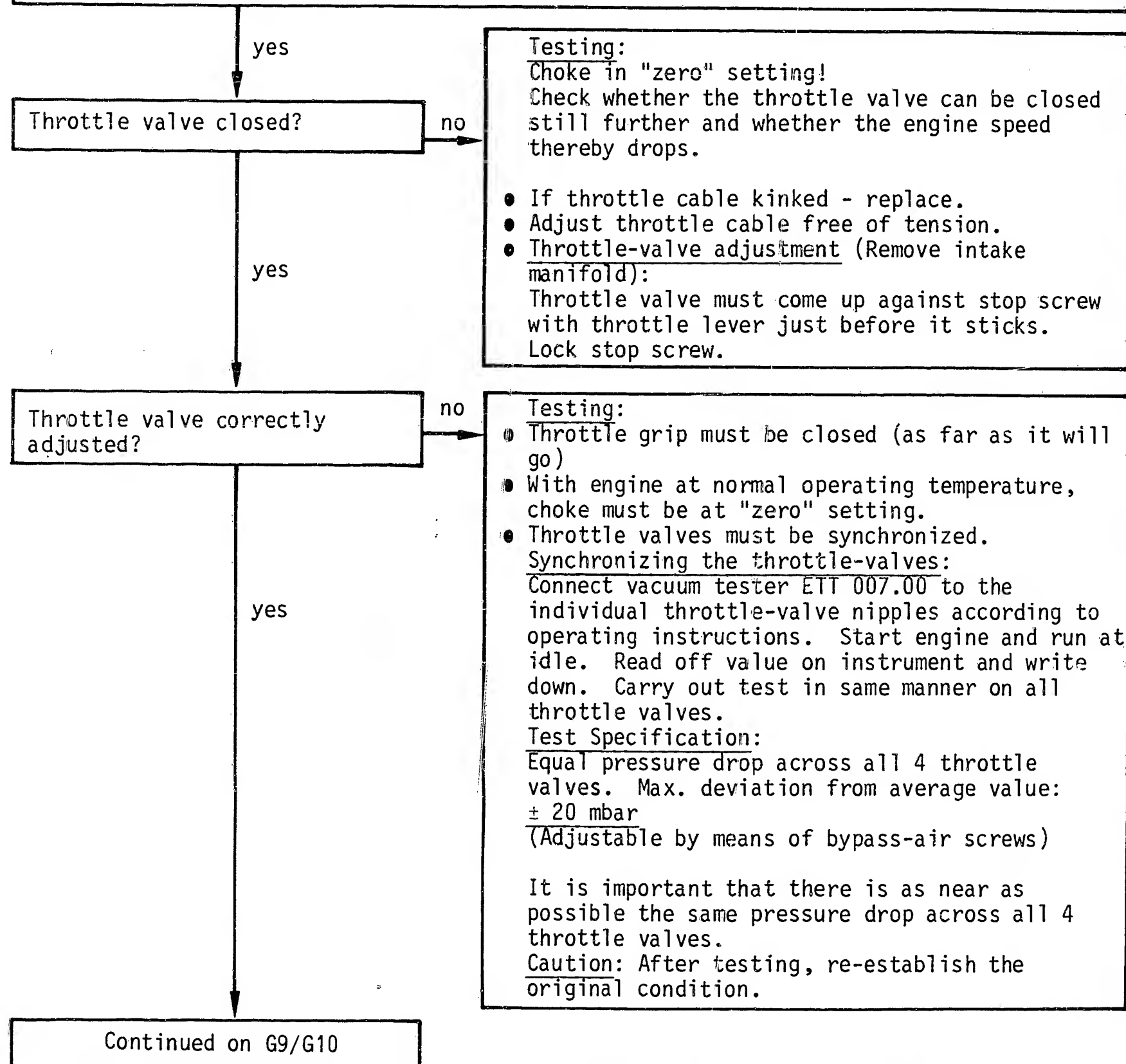


G6

Rough Idle
BMW Motorcycle K 100

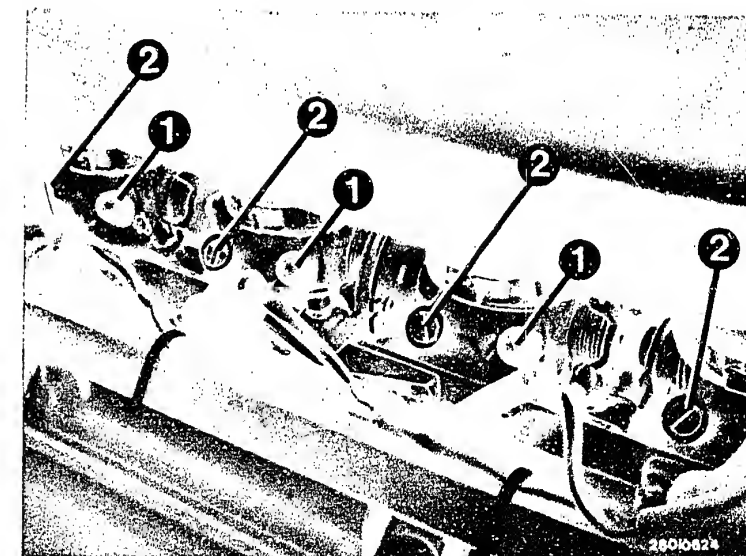


Rough Idle, Incorrect Idle Speed (continued)



Arrow=Throttle-valve stop screw

1=Throttle-valve nipple
2=Bypass-air screw



G7

Rough Idle
BMW Motorcycle K 100



G8

Rough Idle
BMW Motorcycle K 100



Rough Idle, Incorrect Idle Speed (continued)

yes

Idle speed and CO correctly adjusted?

Test Specification:

Idle speed:
900...1000 min⁻¹

CO concentration:
1.5...2.5 vol.%CO

no

Idle Speed and CO Adjustment

Exhaust-gas adjustment with exhaust-gas analyzer with engine at normal operating temperature and at idle speed.

Idle speed: 900...1000 min⁻¹

CO concentration: 1.5...2.5 vol.%CO

The idle speed is adjusted at the idle-speed stop screw (choke at "zero" setting). The idle mixture is adjusted by turning the bypass screw in the air-flow sensor (bore in top part of air filter sealed by rubber plug) with a hexagon-socket-screw key of size 5.

- If CO concentration too high, turn CO adjusting screw in air-flow sensor half a turn in a counterclockwise direction. Check idle speed and CO concentration again. If necessary, make corrections in several steps. After adjusting, use new, red plug (1 280 508 012).

yes

Idle speed not adjustable.

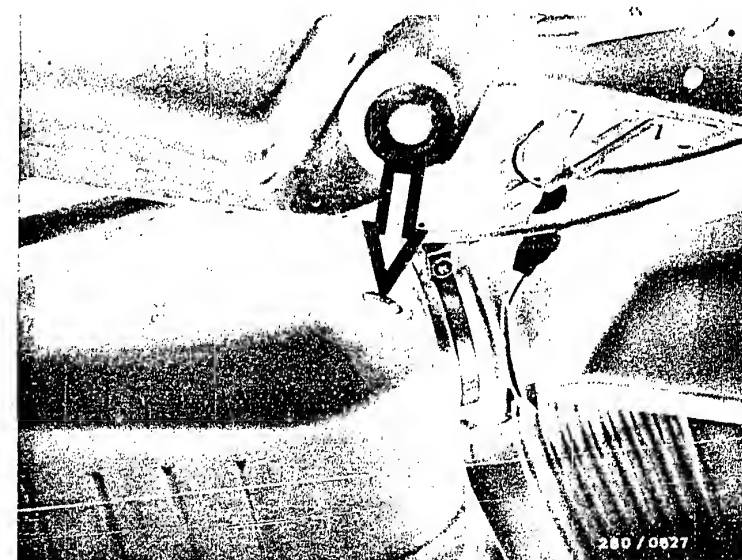
yes

Continued on G11/G12



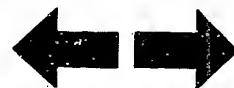
Arrow=Idle-speed adjusting screw

Arrow=CO adjusting screw



G9

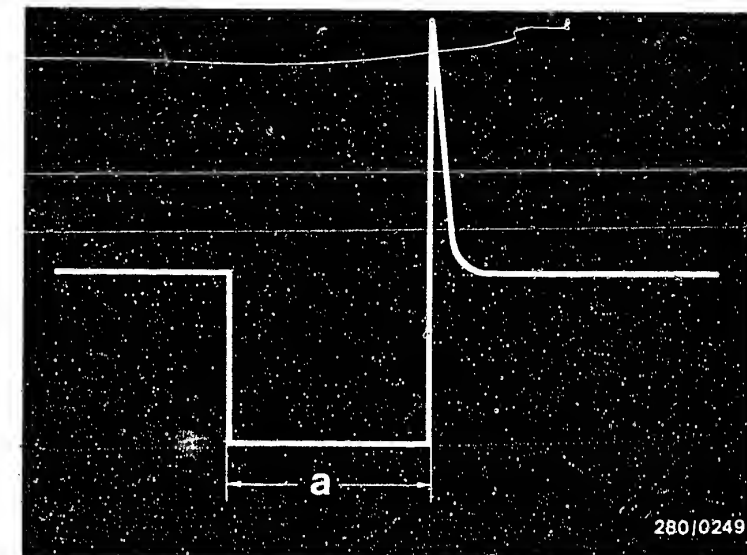
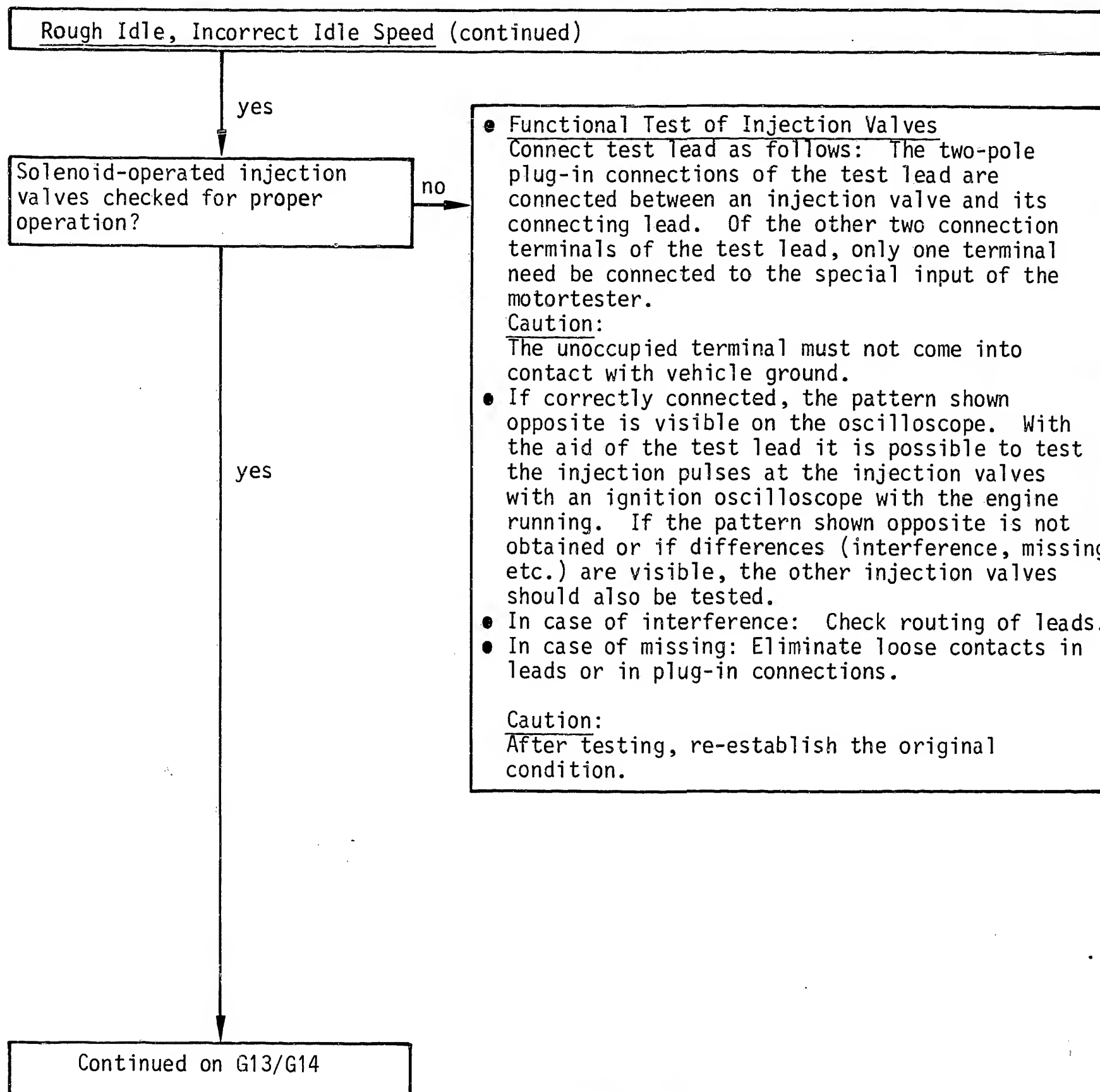
Rough Idle
BMW Motorcycle K 100



G10

Rough Idle
BMW Motorcycle K 100





Injection pulses of a switched output stage (measured at the injection valve)
 a=Pulse length (dependent on engine load)

Rough Idle; Incorrect Idle Speed (continued)

yes

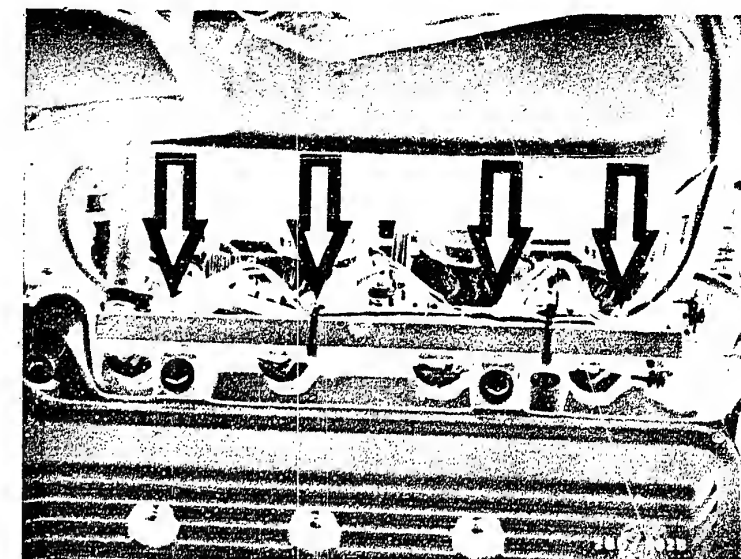
Injection valves mechanically
O.K.?

no

- Mechanical Test of Injection Valves
With the engine running, disconnect injection-
valve connectors individually, one after the
other, from the injection valves and plug on
again. Engine speed must drop if injection
valve O.K.
Caution: After testing, re-establish the
original condition.

yes

Continued on G15/G16



Arrows=Injection-valve connectors

G 13

Rough Idle

BMW Motorcycle K 100



G 14

Rough Idle

BMW Motorcycle K 100



Rough Idle; Incorrect Idle Speed (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

Resistance values within tolerance?

Between term. 8 and term. 9:
160...300 Ω

Between term. 7 and term. 5
(deflect air-flow sensor flap):

60...1000 Ω

no

yes

Continued on G17/G18

Testing:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter.

● Checking the air-flow sensor flap for freedom of movement

Open air-flow sensor flap by hand. It must be possible to move the sensor flap with uniform ease from its fully open position to its fully closed position. When released, the sensor flap must close again fully by itself. Sensor flap must not catch when being opened.

● Mechanical test of air-flow sensor

For further testing, the air-flow sensor must be removed from the top part of the air filter (loosen 2 hexagon-socket-head capscrews and loosen hose to intake manifold). Watch for signs of rubbing. Clean air-flow sensor if very dirty inside and rub out with a lint-free cloth. If there are signs of rubbing, replace air-flow sensor.

● Sensor flap must return to rest position. If not, the stopper of the sensor flap is bent. Replace air-flow sensor.

● Testing the resistances

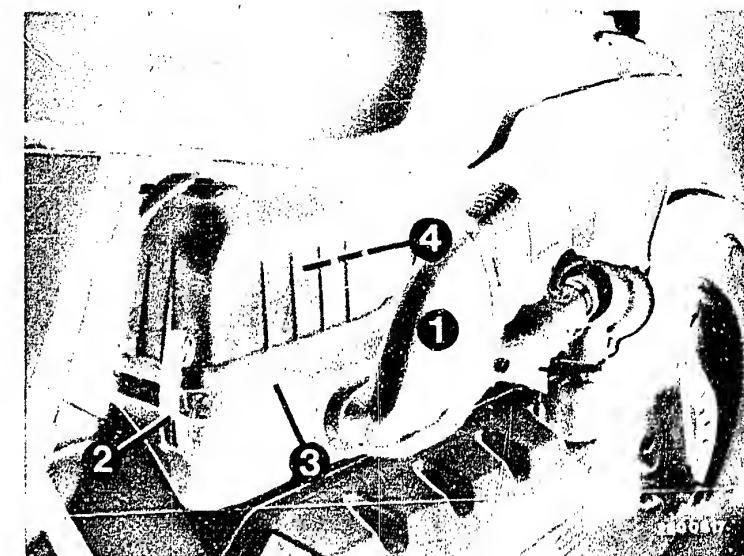
Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: 160...300 Ω

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Deflect sensor flap.

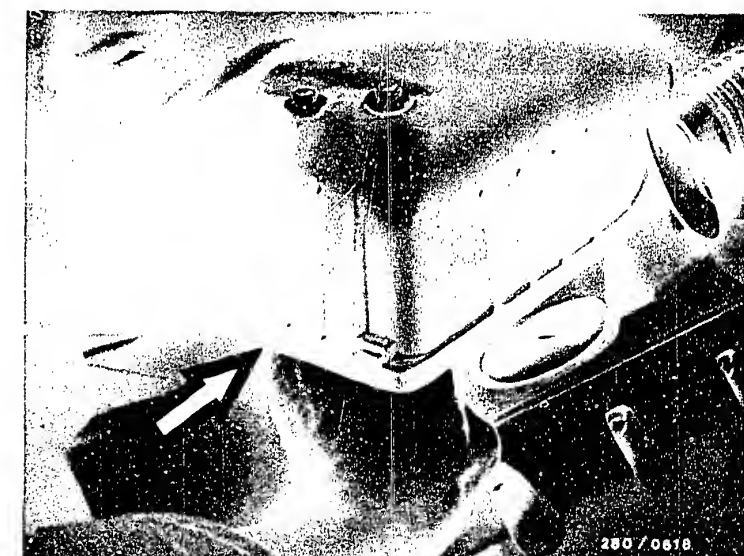
Test specification: 60...1000 Ω

Continued on G17/G18



1=Air guide
2=Snap-on fastener
3=Air filter
4=Air-flow sensor

Opening the air-flow sensor flap



G15

Rough Idle
BMW Motorcycle K 100



G16

Rough Idle
BMW Motorcycle K 100



Rough Idle; Incorrect Idle Speed (continued)

yes

Caution: After testing is completed, the air-flow sensor must be installed again correctly. Re-establish the original condition.

All hose lines correctly connected, not kinked or damaged? Visual examination.

Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

- Check whether hoses of air-intake system and of fuel line system are correctly connected, not kinked or damaged. If necessary, replace hoses. Remedy leaks by means of new seals or by re-tightening the connecting screws.

• Leak Test:

Seal off exhaust tail pipe.

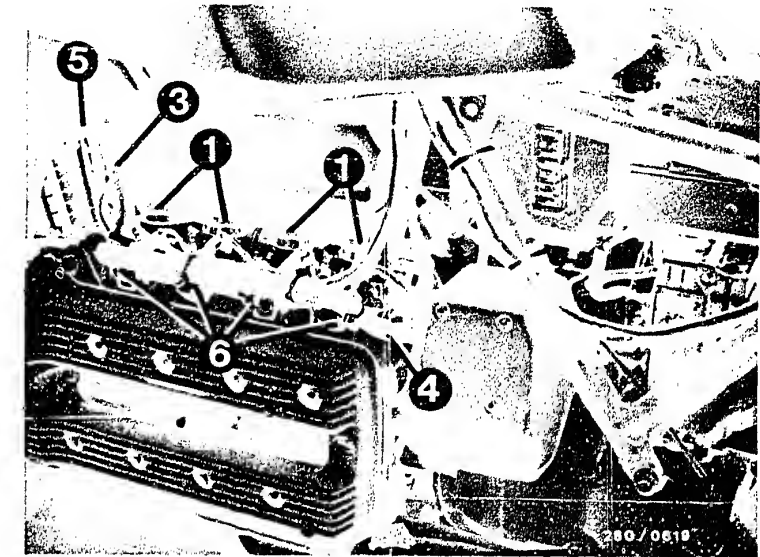
Disconnect air guide to air filter. Unscrew hose between air-flow sensor and intake manifold at air-flow sensor and seal off with a disc (user fabricated). The disc should have a hole through which air (0.3 bar) can be blown in. Open throttle valve fully. Brush or spray all joints with soapy water. Leaks may also occur due to a defective cap seal on the oil filler neck etc.

Bubbling or foaming indicates a leak.

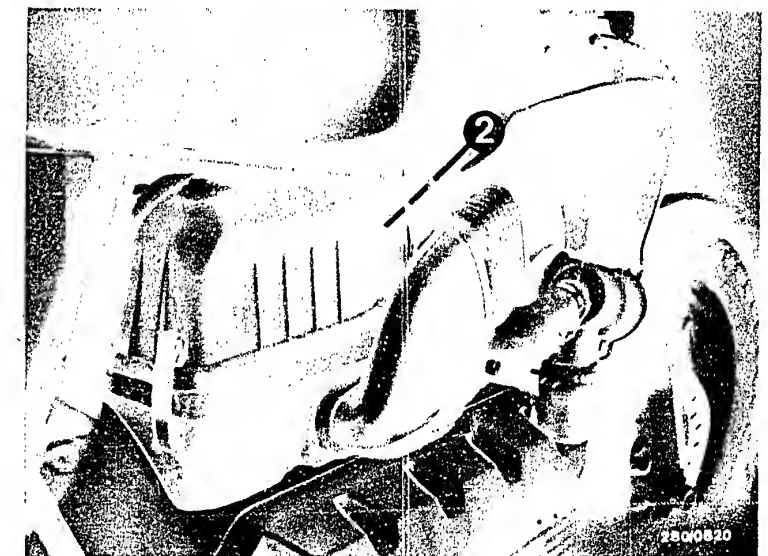
Caution: After testing, re-establish the original condition.

yes

Continued on G19/G20



- 1=Throttle-valve assembly
- 2=Hose between air-flow sensor and intake manifold
- 3=Hose between fuel tank and fuel-distribution pipe
- 4=Hose from fuel-distribution pipe to pressure regulator
- 5=Hose between pressure regulator and fuel tank
- 6=Injection valves



G17

Rough Idle
BMW Motorcycle K 100

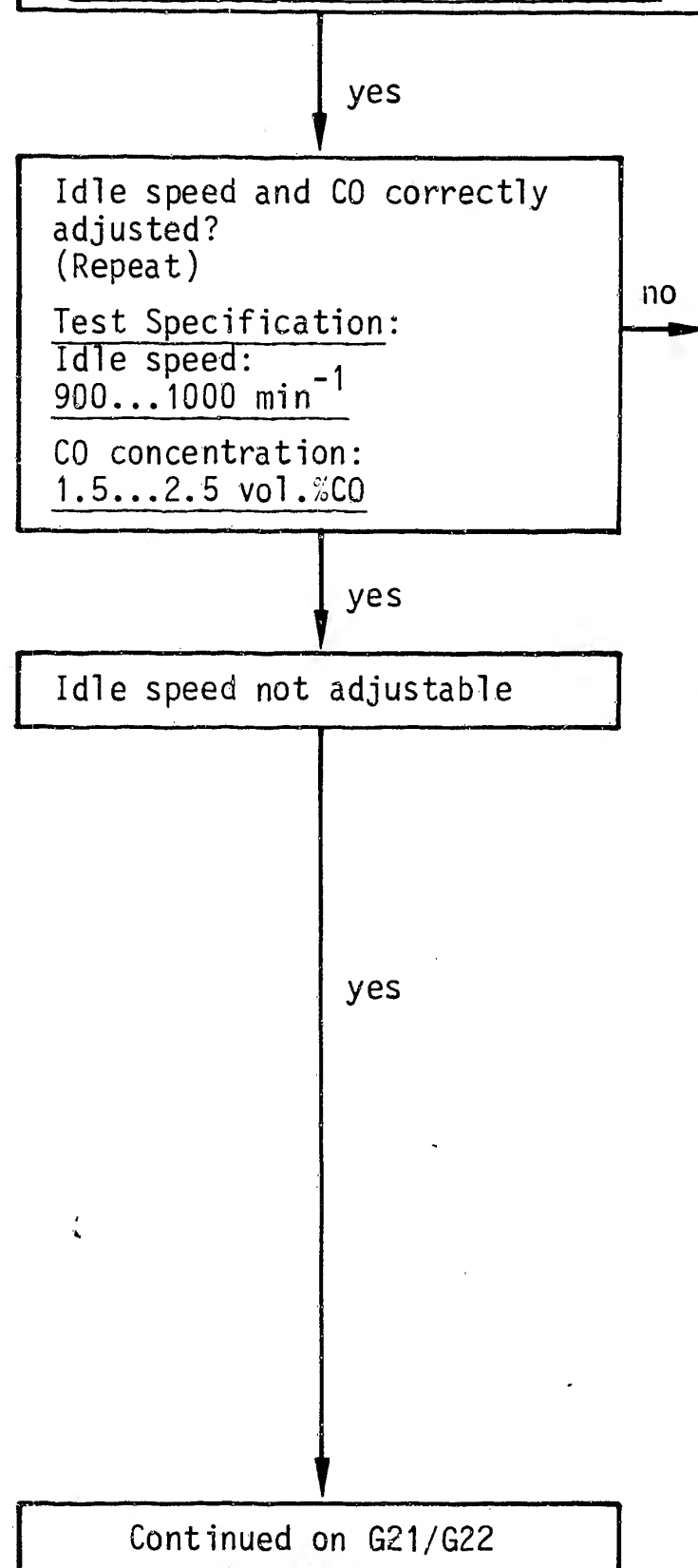


G18

Rough Idle
BMW Motorcycle K 100



Rough Idle; Incorrect Idle Speed (continued)



● Idle Speed and CO Adjustment

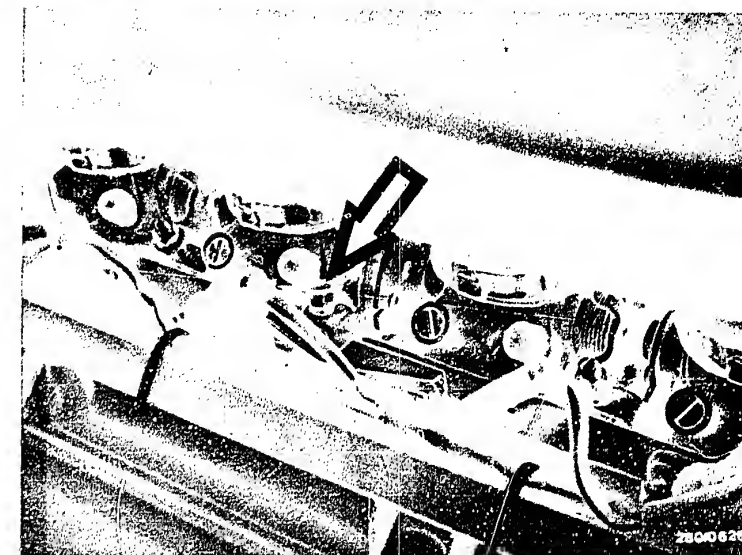
Exhaust-gas adjustment with exhaust-gas analyzer with engine at normal operating temperature and at idle speed.

Idle speed: 900...1000 min⁻¹

CO concentration: 1.5...2.5 vol.%CO

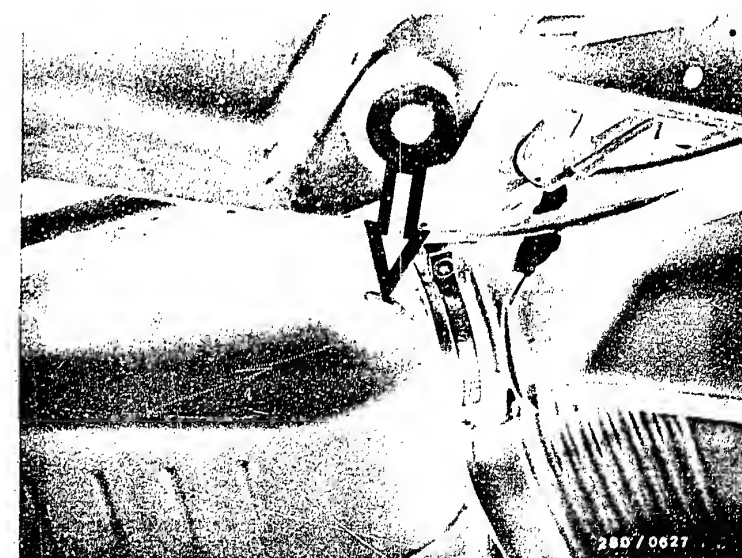
The idle speed is adjusted at the idle-speed stop screw (choke at "zero" setting). The idle mixture is adjusted by turning the bypass screw in the air-flow sensor (bore in top part of air filter sealed by rubber plug) with a hexagon-socket-screw key of size 5.

- If CO concentration too high, turn CO adjusting screw in air-flow sensor half a turn in a counterclockwise direction. Check idle speed and CO concentration again. If necessary, make corrections in several steps. After adjusting, use new, red plug (1 280 508 012).



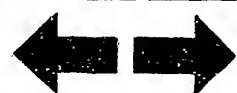
Arrow=Idle-speed adjusting screw

Arrow=CO adjusting screw



G 19

Rough Idle
BMW Motorcycle K 100



G 20

Rough Idle
BMW Motorcycle K 100



Rough Idle; Incorrect Idle Speed (continued)

yes

Trouble-shooting program
completed for customer
complaint

"Rough Idle; Incorrect Idle
Speed"

Fault remedied?

no

Further Possibilities:

- Customer complaint incorrectly diagnosed.
(See Coordinates C5...C8). If the fault has
not been detected with the "direct trouble-
shooting chart", see "detailed trouble-shooting
chart" (Coordinates C3/C4).
- Engine not mechanically O.K. (compression,
valve setting, valve timing, worn camshaft).

G21

Rough Idle
BMW Motorcycle K 100



G22

Rough Idle
BMW Motorcycle K 100



POOR THROTTLE TAKE-UP

Trouble-shooting program according to customer complaint

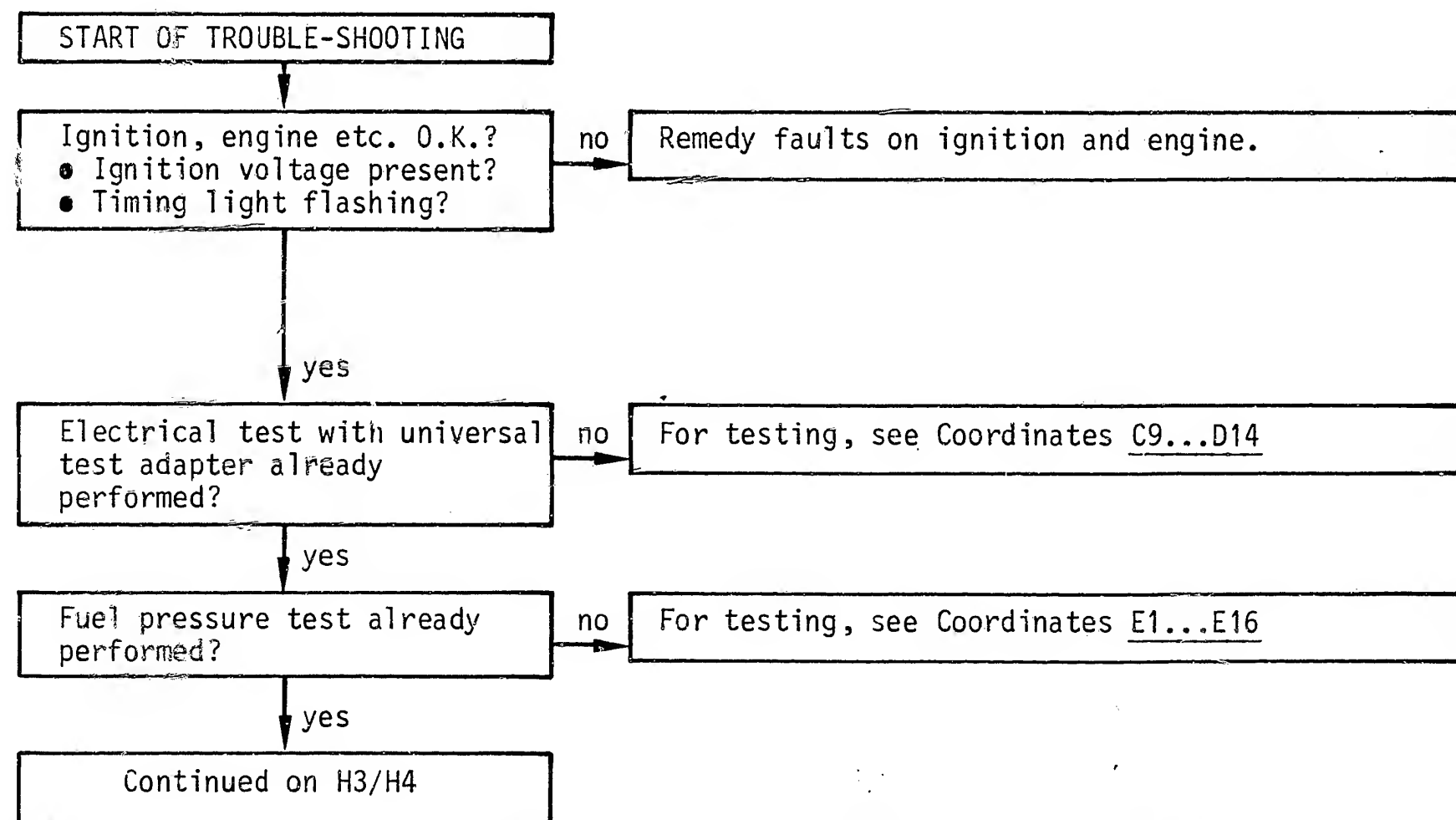
Procedure

The test is divided into 3 rows of boxes:

- The left-hand row contains the questions for the tests.
- The center row describes the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.



H1

Poor Throttle Take-up
BMW Motorcycle K 100

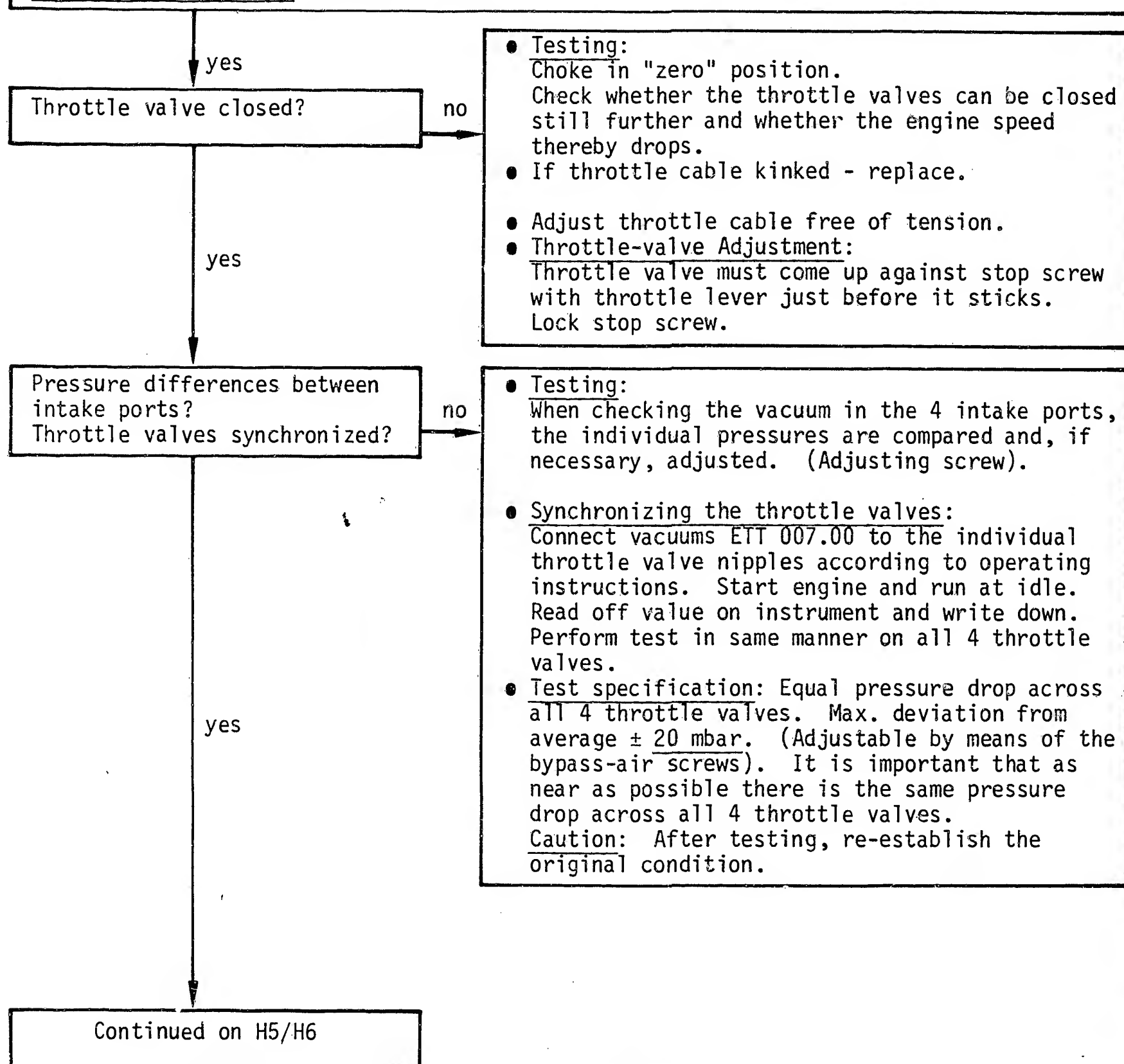


H2

Poor Throttle Take-up
BMW Motorcycle K 100

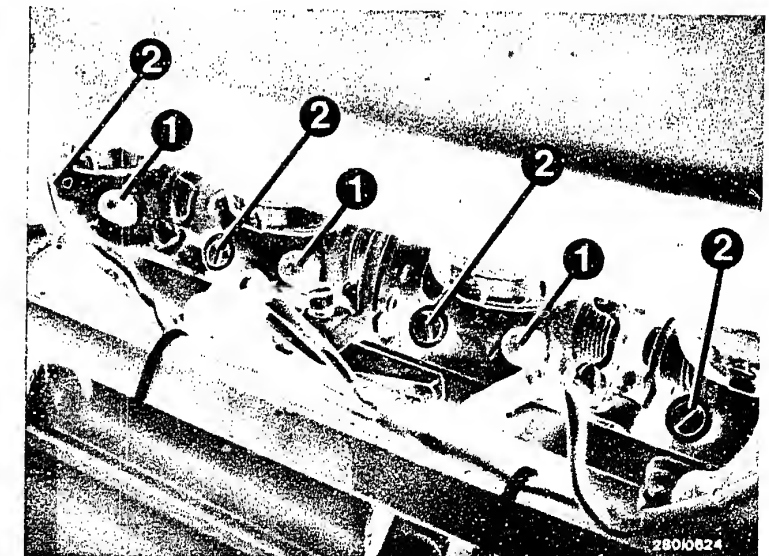


Poor Throttle Take-up (continued)



Arrow=Throttle-valve stop screw

1=Throttle-valve nipples
2=Bypass-air screws



H3

Poor Throttle Take-up
BMW Motorcycle K 100



H4

Poor Throttle Take-up
BMW Motorcycle K 100



Poor Throttle Take-up (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

Resistance values within tolerance?

Between term. 8 and term. 9:
160...300 Ω

Between term. 7 and term. 5
(deflect air-flow sensor flap):
60...1000 Ω

no

Testing:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter.

● Checking the air-flow sensor flap for freedom of movement

Open air-flow sensor flap by hand. It must be possible to move the sensor flap with uniform ease from its fully open position to its fully closed position. When released, the sensor flap must close again fully by itself. Sensor flap must not catch when being opened.

● Mechanical test of air-flow sensor

For further testing, the air-flow sensor must be removed from the top part of the air filter (loosen 2 hexagon-socket-head capscrews and loosen hose to intake manifold). Watch for signs of rubbing. Clean air-flow sensor if very dirty inside and rub out with a lint-free cloth. If there are signs of rubbing, replace air-flow sensor.

● Sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. Replace air-flow sensor.

● Testing the resistances

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

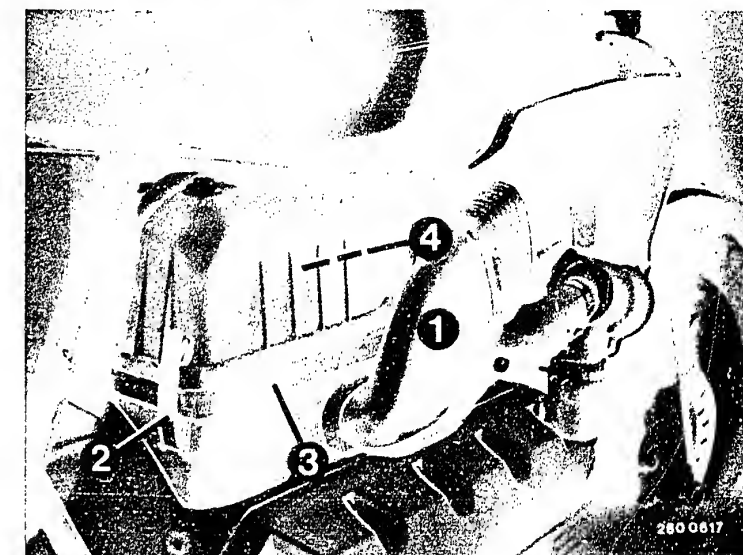
Test specification: 160...300 Ω

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Deflect sensor flap.

Test specification: 60...1000 Ω

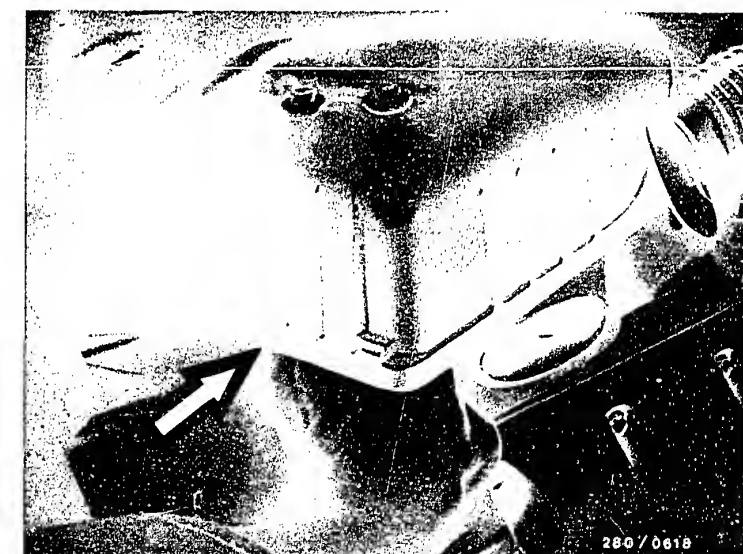
yes

Continued on H7/H8



1=Air guide
2=Snap-on fastener
3=Air filter
4=Air-flow sensor

Opening the air-flow sensor flap



H5

Poor Throttle Take-up
BMW Motorcycle K 100



H6

Poor Throttle Take-up
BMW Motorcycle K 100



Poor Throttle Take-up (continued)

yes

Air-flow sensor potentiometer
O.K.?

no

yes

Continued on H11/H12

Potentiometer Test (Noise Test)

Removing the air-flow sensor:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter. Loosen air-flow sensor from top part of air filter (2 hexagon-socket-head capscrews). Leave plug on. Set motortester to special input and, using special cable, connect to air-flow sensor term. 7 (red clip) and term. 5 (black clip).

Making the adapter lead:

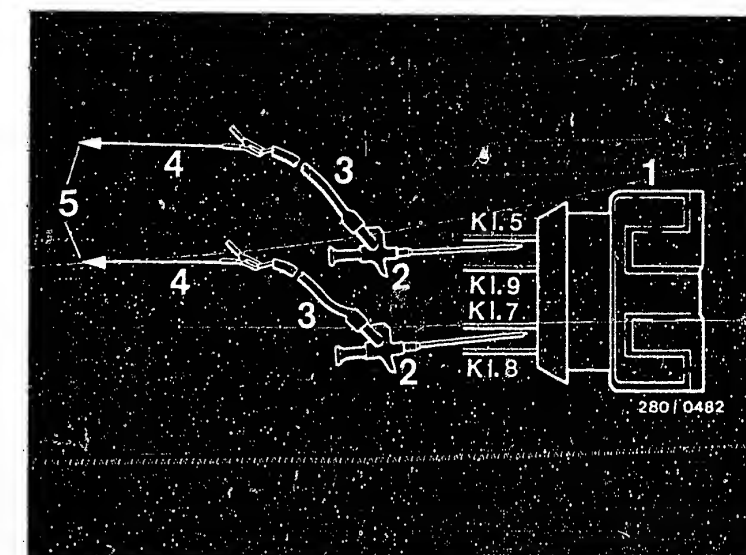
User-fabricated: Two approx. 1 m. long leads of approx. 1.0 mm² cross section. 2 test prods are fastened on one end. On the other end, strip off approx. 2 cm. of insulation and connect the clamps of the special input connecting lead.

Caution:

Insulate any bare connection points on the adapter lead (danger of short circuit). Measure carefully into the plug of the air-flow sensor. Do not bend any contact springs. Set control lever for image adjustment on motor-tester as far as it will go to the left (calibrated setting).

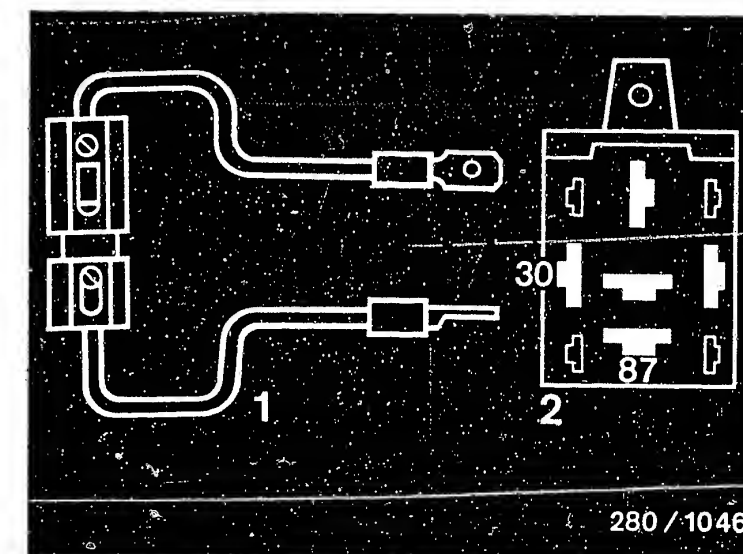
- Disconnect injection relay and insert jumper into connection base between term. 30 and term. 87. (Power supply to control unit). To remove the injection relay, hinge up the seat bench and remove control unit, fuel tank and central electrics box cover.

Continued on H9/H10



- 1=Air-flow sensor plug
- 2=Test prod
- 3=Adapter lead (user-fabricated)
- 4=Special input connecting lead
- 5=Motortester special input

- 1=Jumper with fuse holder and 10 A fuse
- 2=Top view of connection base



H7

Poor Throttle Take-up
BMW Motorcycle K 100



H8

Poor Throttle Take-up
BMW Motorcycle K 100



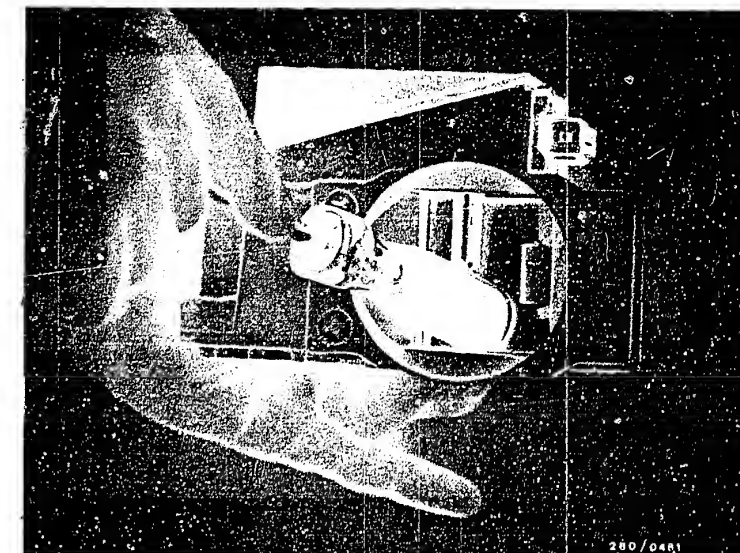
Poor Throttle Take-up (continued)

- Deflect air-flow sensor flap suddenly several times. A continuous stroke signal must be visible on the oscilloscope. If the air-flow sensor is defective, there is a noise signal similar to the one shown opposite. Replace air-flow sensor. Disconnect adapter lead after testing and put on rubber sleeve properly (on air filter as well as on plug). Mount air-flow sensor. Connect all hoses and tighten. (Make sure there are no leaks).

Caution: After testing, remove the jumper and connect the injection relay. Put cover on central electrics box. Install fuel tank and control unit. Hinge down seat bench and lock.

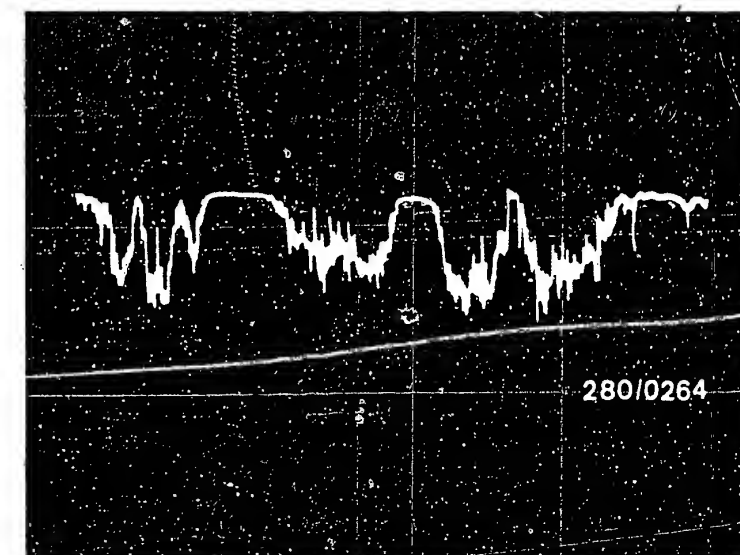
yes

Continued on H11/H12



Opening the air-flow sensor flap

Noise signal if air-flow sensor defective



H9

Poor Throttle Take-up
BMW Motorcycle K 100



H10

Poor Throttle Take-up
BMW Motorcycle K 100



Poor Throttle Take-up (continued)

All hose lines correctly connected, not kinked or damaged? Visual examination.

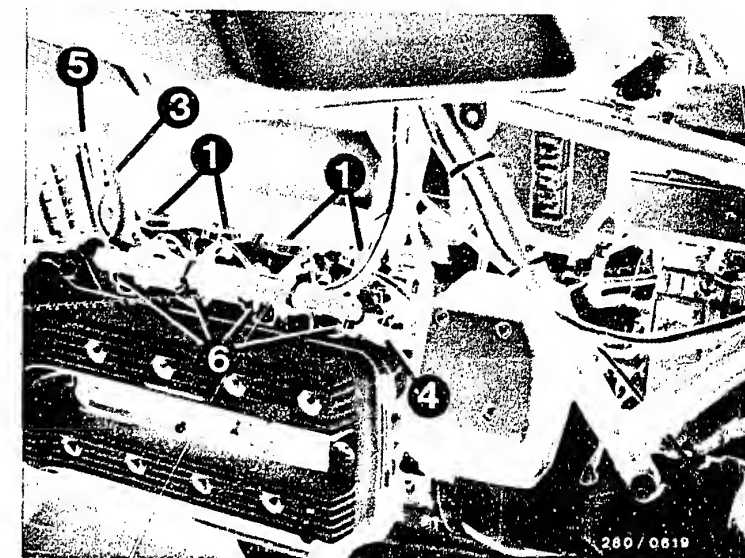
Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

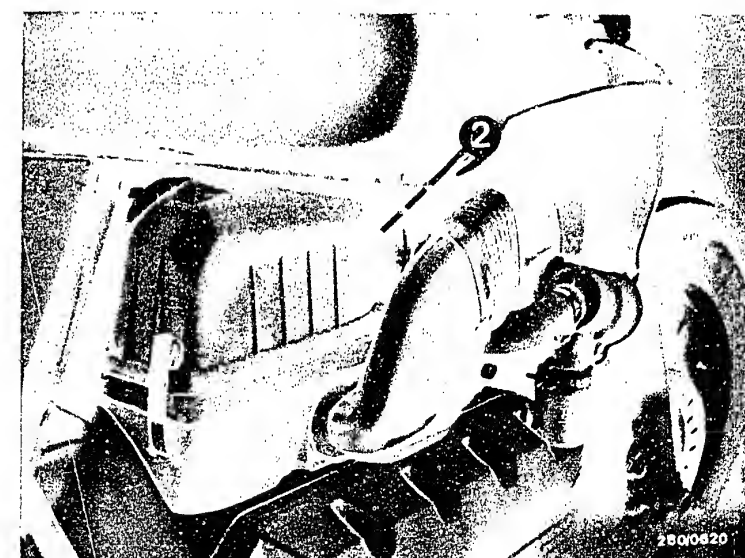
- Check whether hoses of air-intake system and of fuel line system are correctly connected, not kinked or damaged. If necessary, replace hoses. Remedy leaks by means of new seals or by re-tightening the connecting screws.
- Leak Test:
Seal off exhaust tail pipe.
Disconnect air guide to air filter. Unscrew hose between air-flow sensor and intake manifold at air-flow sensor and seal off with a disc (user-fabricated). The disc should have a hole through which air (0.3 bar) can be blown in. Open throttle valve fully. Brush or spray all joints with soapy water. Leaks may also occur due to a defective cap seal on the oil filler neck etc.
Bubbling or foaming indicates a leak.
Caution: After testing, re-establish the original condition.

yes

Continued on H13/H14



- 1=Throttle-valve assembly
- 2=Hose between air-flow sensor and intake manifold
- 3=Hose between fuel tank and fuel-distribution pipe
- 4=Hose from fuel-distribution pipe to pressure regulator
- 5=Hose between pressure regulator and fuel tank
- 6=Injection valves



H11

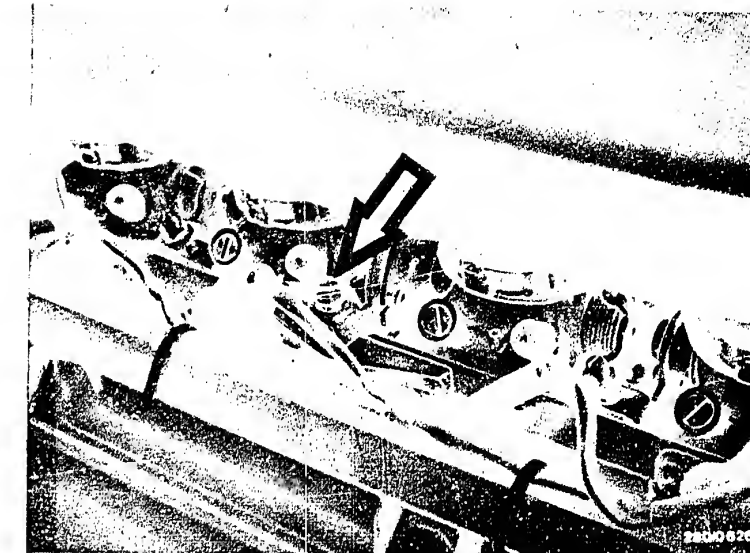
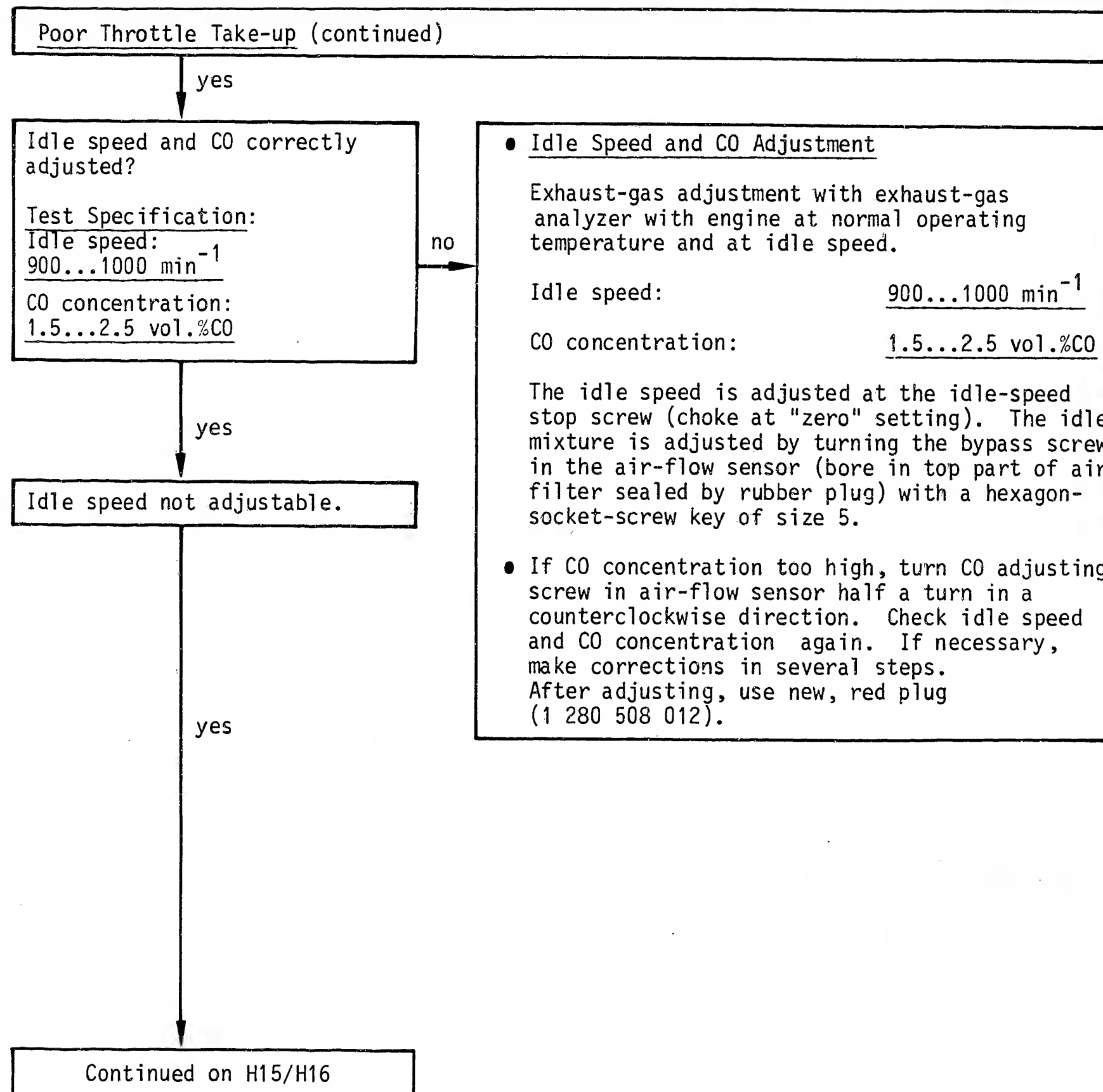
Poor Throttle Take-up
BMW Motorcycle K 100



H12

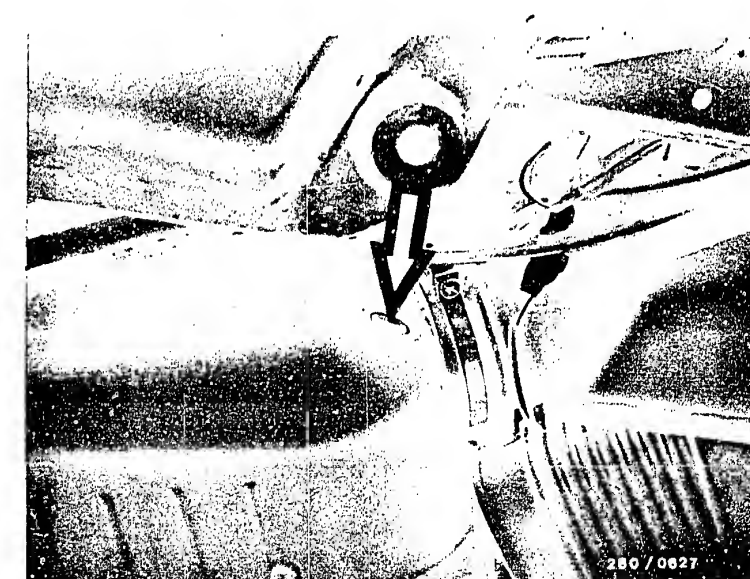
Poor Throttle Take-up
BMW Motorcycle K 100





Arrow=Idle-speed adjusting screw

Arrow=CO adjusting screw



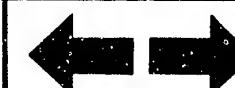
H13

Poor Throttle Take-up
BMW Motorcycle K 100



H14

Poor Throttle Take-up
BMW Motorcycle K 100



Poor Throttle Take-up (continued)

yes

Trouble-shooting program
completed for customer
complaint

"Poor Throttle Take-up".

Fault remedied?

no

Further Possibilities:

- Customer complaint incorrectly diagnosed.
(See Coordinates C5...C8). If the fault has
not been detected with the "direct trouble-
shooting chart", see "detailed trouble-shooting
chart" (Coordinates C3/C4).
- Engine not mechanically O.K. (compression,
valve setting, valve timing, worn camshaft).

H15

Poor Throttle Take-up
BMW Motorcycle K 100



H16

Poor Throttle Take-up
BMW Motorcycle K 100



ENGINE MISSING UNDER ALL OPERATING CONDITIONS

Trouble-shooting program according to customer complaint

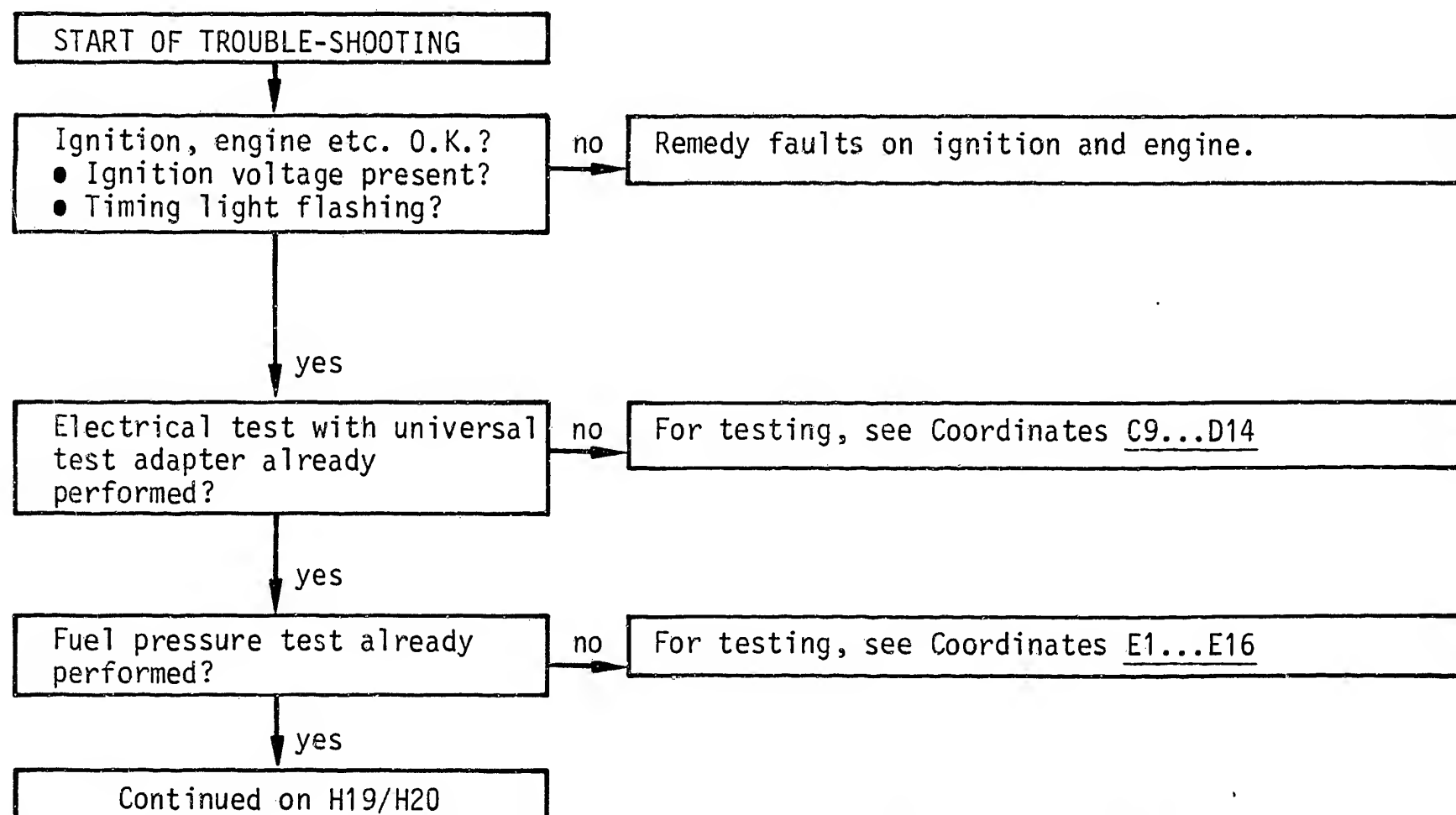
Procedure

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- The left-hand row contains the questions for the tests.
- The center row describes the testing and adjustment operations on the components.
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If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.



H17

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



H18

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

Alternator with regulator
O.K.?

no

• With engine switched off, disconnect plug from alternator. Start engine. If missing stops, check alternator and regulator. Voltage peaks are visible on the ignition oscilloscope. Caution: After testing, re-establish the original condition.

yes

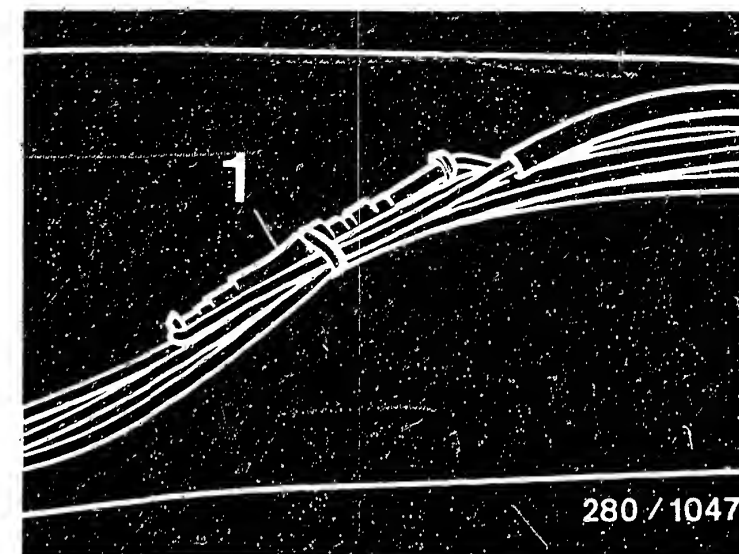
Altitude compensation O.K.?
Altitude not higher than
1200 m above mean sea level?

no

On the US version, an additional plug-in connector is mounted on the wiring harness under the left-hand battery cover for switching on the altitude compensation. If the connectors are removed from the spacer sleeve and connected together, the altitude compensation is switched on and the air-fuel mixture is leaned by approx. 5%. The use of the altitude compensation is necessary as of 1200 m above mean sea level in order to comply with the US emission regulations.

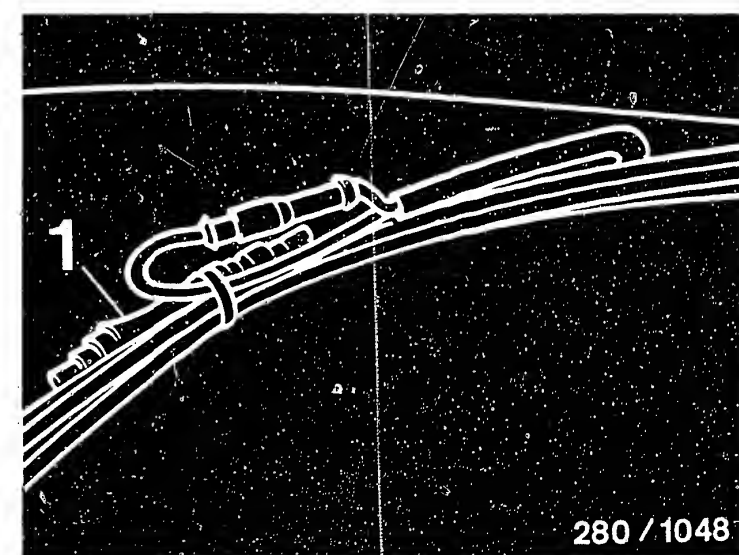
yes

Continued on H21/H22



Plug-in connector
Altitude compensation not connected
1=Spacer sleeve

Plug-in connector
Altitude compensation connected
1=Spacer sleeve



H19

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



H20

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

Resistance values within tolerance?

Between term. 8 and term. 9:
160...300 Ω

Between term. 7 and term. 5
(deflect air-flow sensor flap):

60...1000 Ω

no

Testing:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter.

● Checking the air-flow sensor flap for freedom of movement

Open air-flow sensor flap by hand. It must be possible to move the sensor flap with uniform ease from its fully open position to its fully closed position. When released, the sensor flap must close again fully by itself. Sensor flap must not catch when being opened.

● Mechanical test of air-flow sensor

For further testing, the air-flow sensor must be removed from the top part of the air filter (loosen 2 hexagon-socket-head capscrews and loosen hose to intake manifold). Watch for signs of rubbing. Clean air-flow sensor if very dirty inside and rub out with a lint-free cloth.

If there are signs of rubbing, replace air-flow sensor.

● Sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. Replace air-flow sensor.

● Testing the resistances

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

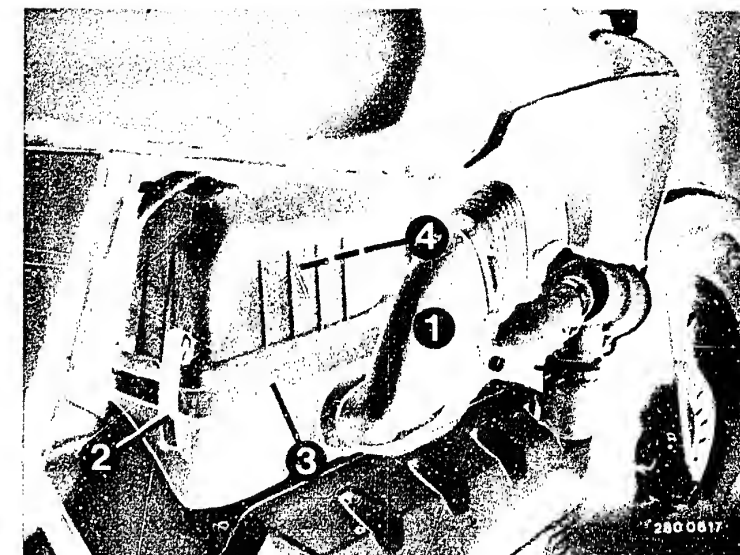
Test specification: 160...300 Ω

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Deflect sensor flap.

Test specification: 60...1000 Ω

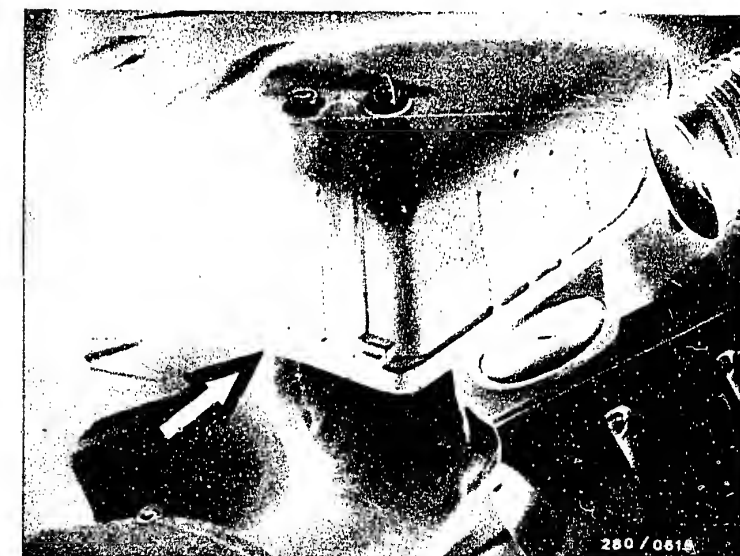
yes

Continued on H23/H24



1=Air guide
2=Snap-on fastener
3=Air filter
4=Air-flow sensor

Opening the air-flow sensor flap



H21

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



H22

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

Air-flow sensor
potentiometer O.K.?

no

yes

Continued on J3/J4

Potentiometer Test (Noise Test)

Removing the air-flow sensor:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter. Loosen air-flow sensor from top part of air filter (2 hexagon-socket-head capscrews). Leave plug on. Set motortester to special input and, using special cable, connect to air-flow sensor term. 7 (red clip) and term. 5 (black clip).

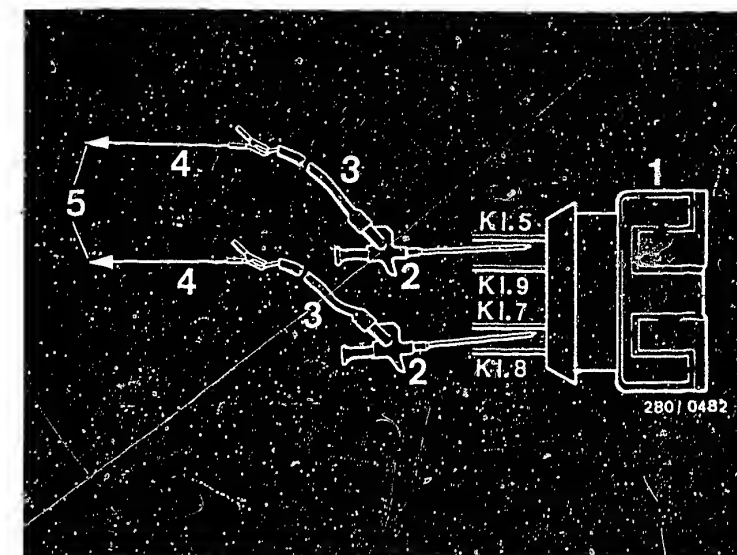
Making the adapter lead:

User-fabricated: Two approx. 1 m. long leads of approx. 1.0 mm² cross section. 2 test prods are fastened on one end. On the other end, strip off approx. 2 cm of insulation and connect the clamps of the special input connecting lead.

Caution:

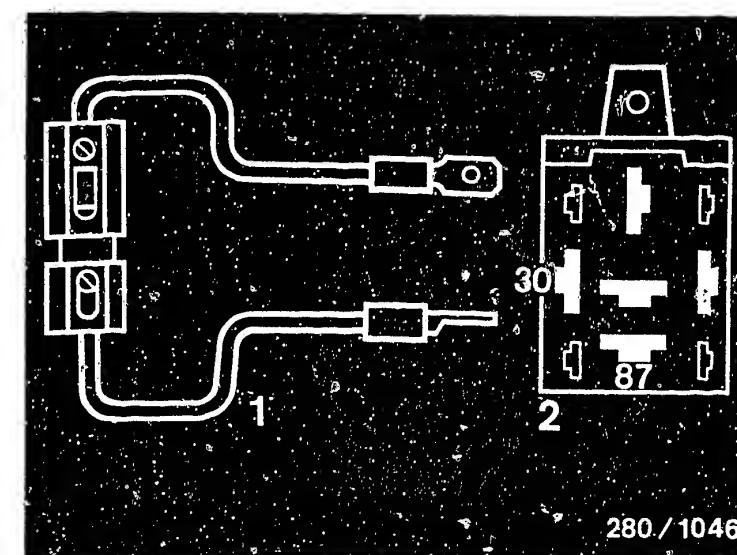
Insulate any bare connection points on the adapter lead (danger of short circuit). Measure carefully into the plug of the air-flow sensor. Do not bend any contact springs. Set control lever for image adjustment on motor-tester as far as it will go to the left (calibrated setting). Disconnect injection relay and insert jumper into connection base between term. 30 and term. 87. (Power supply to control unit). To remove the injection relay, hinge up the seat bench and remove control unit, fuel tank and central electrics box cover.

Continued on J1/J2



- 1=Air-flow sensor plug
- 2=Test prod
- 3=Adapter lead (user-fabricated)
- 4=Special input connecting lead
- 5=Motortester special input

- 1=Jumper with fuse holder and 10 A fuse
- 2=Top view of connection base



H23

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



H24

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



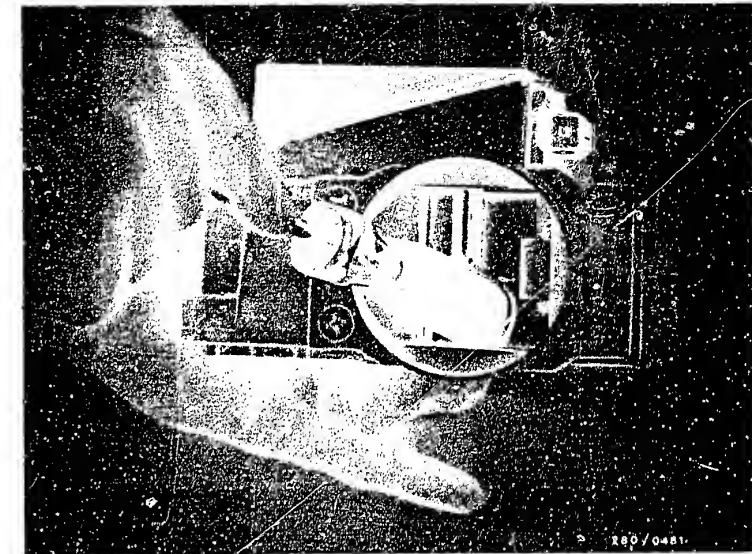
Engine Missing Under All Operating Conditions (continued)

- Deflect air-flow sensor flap suddenly several times. A continuous stroke signal must be visible on the oscilloscope. If the air-flow sensor is defective, there is a noise signal similar to the one shown opposite. Replace air-flow sensor. Disconnect adapter lead after testing and put on rubber sleeve properly (on air filter as well as on plug). Mount air-flow sensor. Connect all hoses and tighten. (Make sure there are no leaks).

Caution: After testing, remove the jumper and connect the injection relay. Put cover on central electrics box. Install fuel tank and control unit. Hinge down seat bench and lock.

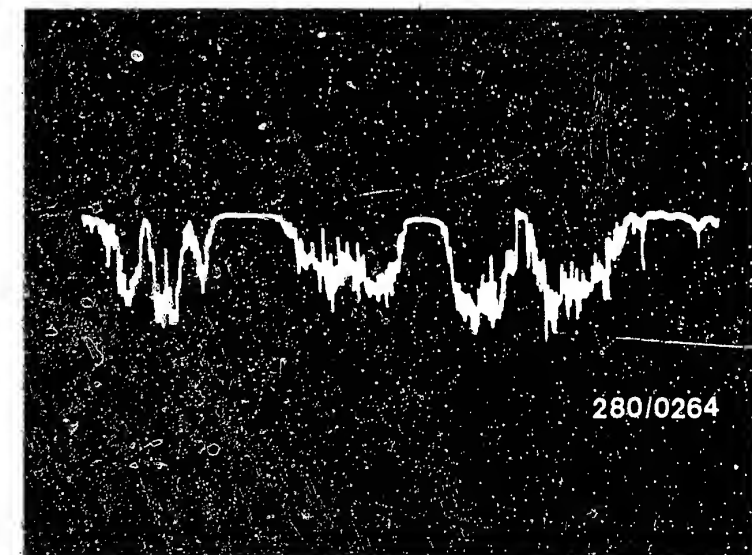
yes

Continued on J3/J4



Opening the air-flow sensor flap

Noise signal if air-flow sensor defective



J1

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



J2

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

Fuel delivery of in-tank pump
O.K.?

Test specification:

min. 600 cm³/30s

Test specification reached?

no

● Measuring the fuel delivery:

- Remove left-hand battery cover.
 - Unhook radiator covers on left and right.
 - Hinge up seat bench.
 - Loosen fuel tank.
 - Take off central-electrics box cover.
 - Disconnect injection relay.
 - Loosen connection between fuel tank and return hose. Extend hose, if necessary, and lead into a 5 l vessel with graduated scale. Insert jumper into injection-relay connection base between term. 87b and term. 30. In-tank pump must operate.
- Test specification: min. 600 cm³/30s

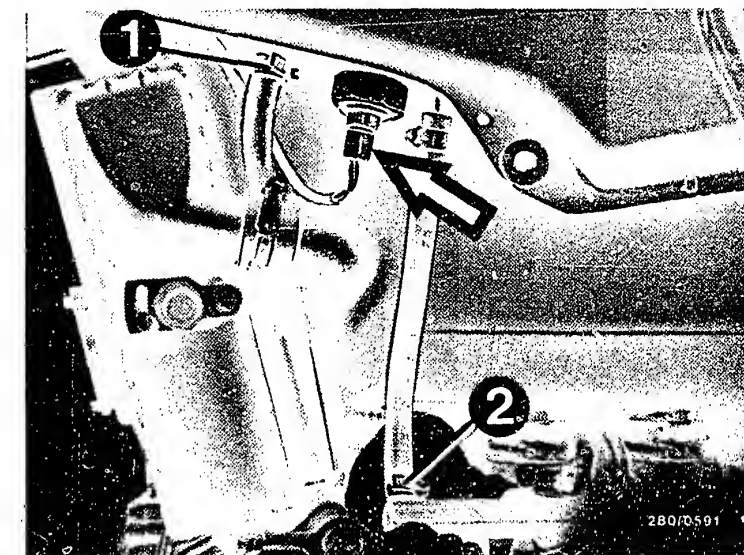
Remedy if test specification not reached:

- Fuel filter clogged - replace through tank filler neck.
Caution: Drain fuel tank before removing pump/filter. Be careful when handling fuels.
- Voltage at plug must be min. 12 V.
If not, clean contacts, possibly eliminate poor ground connection (under fuel tank on frame). Replace leads.

yes

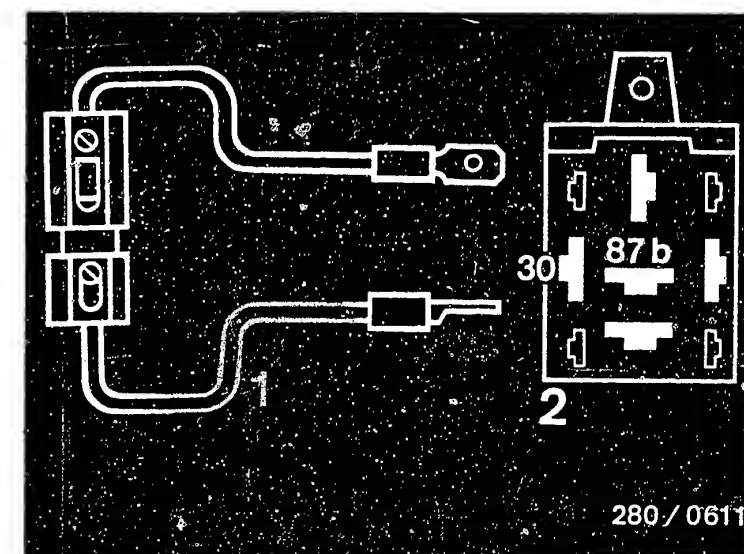
Continued on J7/J8

Continued on J5/J6



1, 2 = Hose clamps
Arrow = Plug

1=Jumper with fuse holder and 10 A fuse (user-fabricated)
2=Top view of connection base



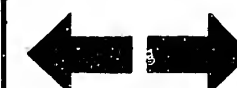
J3

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



J4

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

- Pressure regulator defective - replace.
- If fuel delivery too low, replace in-tank pump.
- If test specification reached immediately or fault eliminated and then test specification reached:
Remove jumper from connection base (must always be done immediately after measuring).
Connect injection relay and put cover on central-electrics box. Re-mount fuel tank and connect return hose to fuel tank and fasten. Lock seat bench. Hook in radiator covers on left and right and mount left-hand battery cover. Check fuel circuit for leaks.

Continued on J7/J8

J5

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100

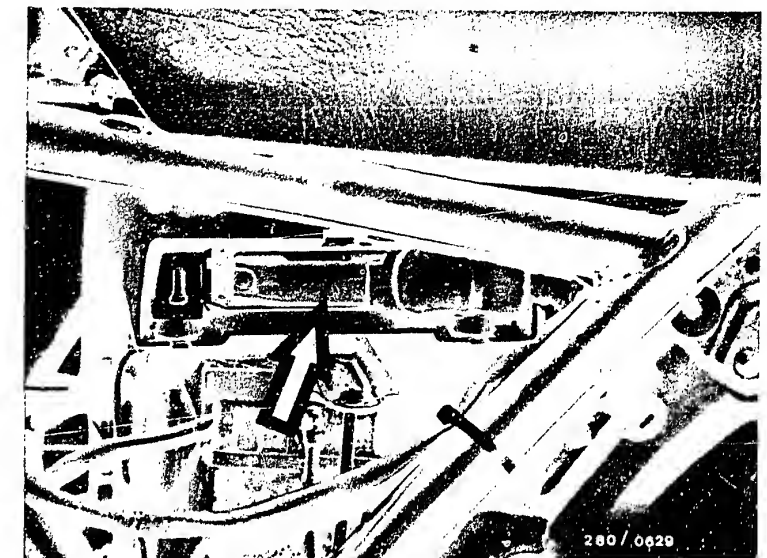
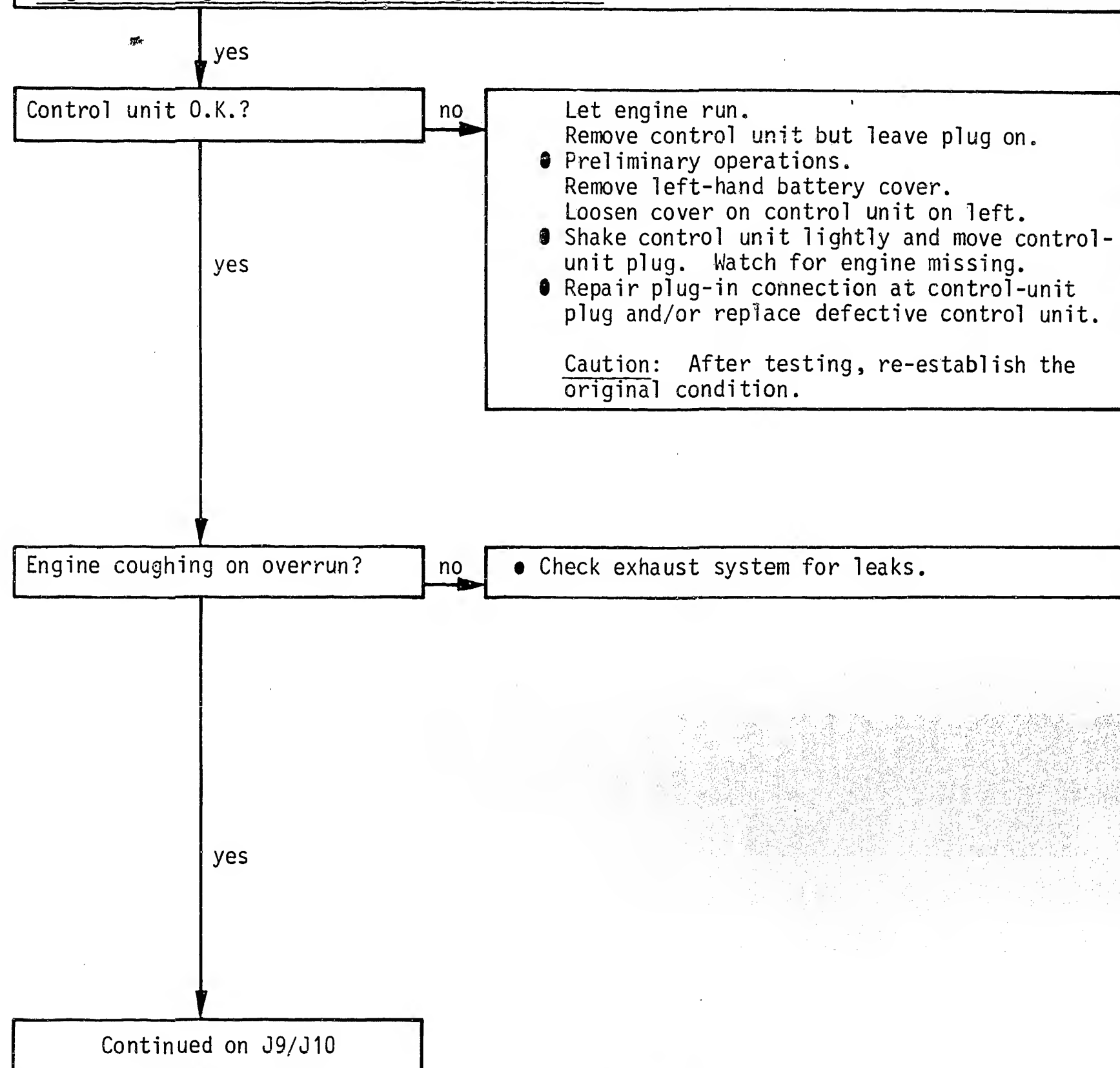


J6

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)



Arrow=Control-unit plug

J7

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100

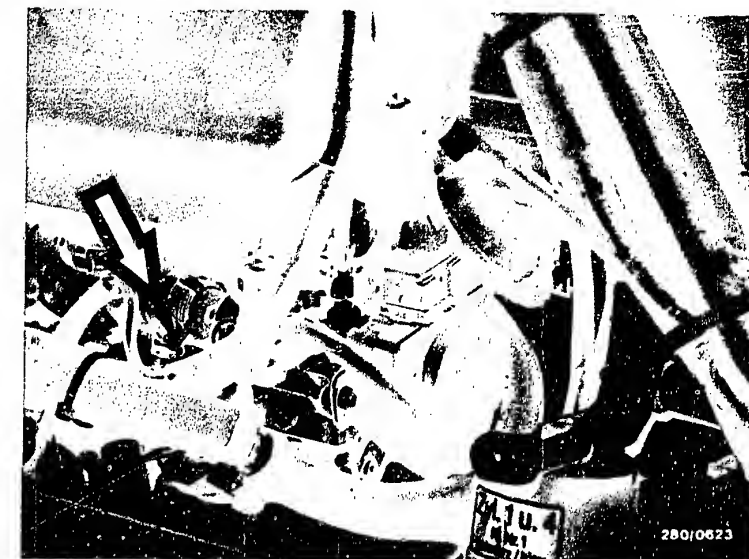
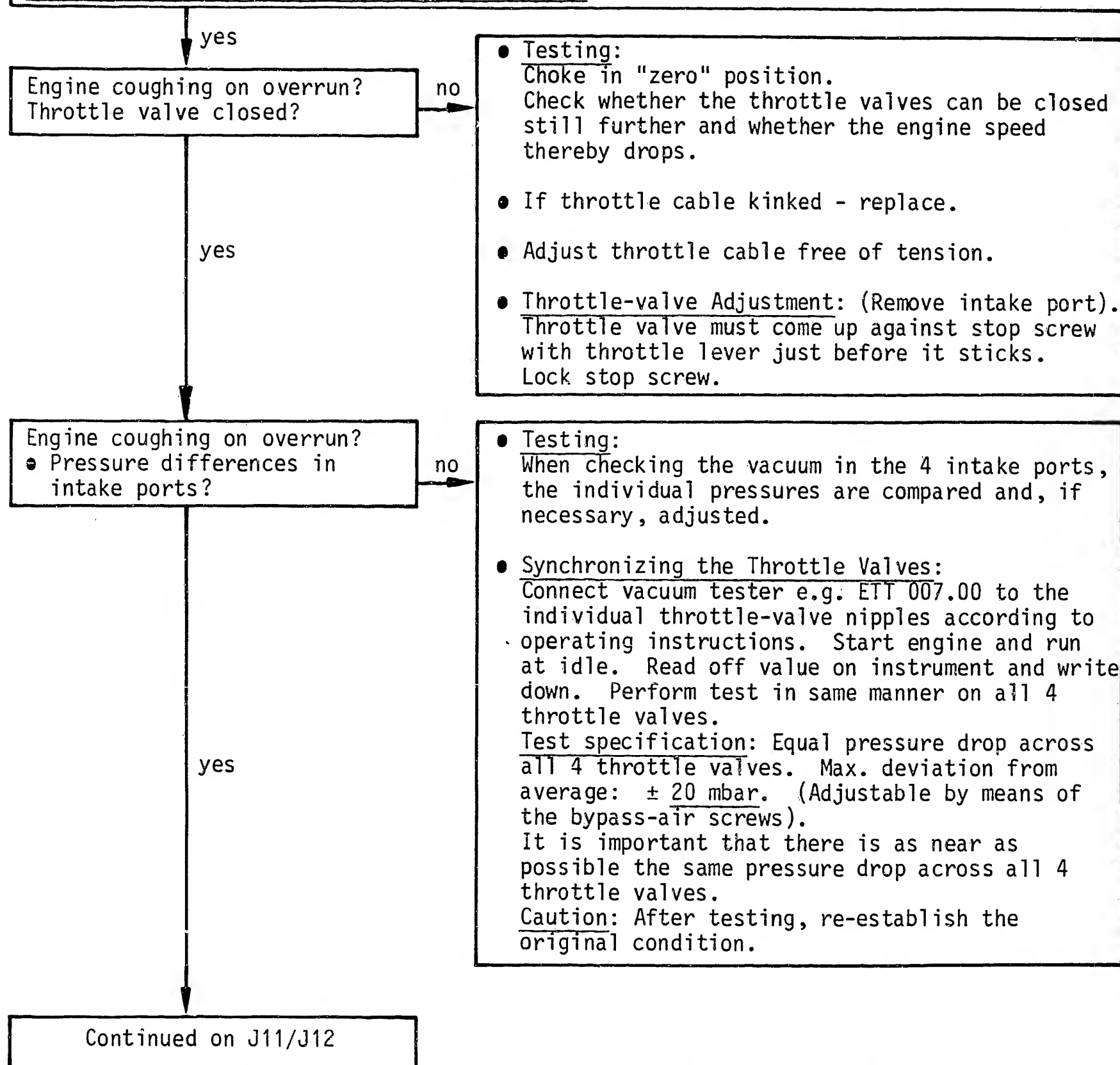


J8

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100

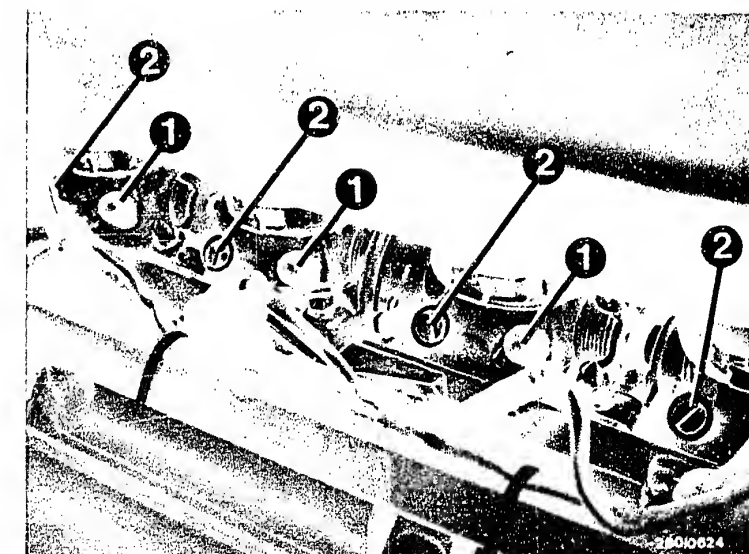


Engine Missing Under All Operating Conditions (continued)



Arrow=Throttle-valve stop screw

1=Throttle-valve nipples
2=Bypass-air screws



J9

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100

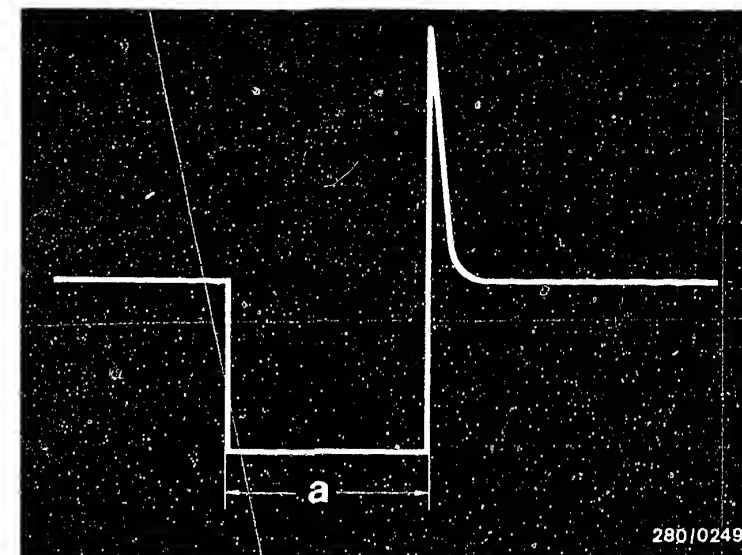
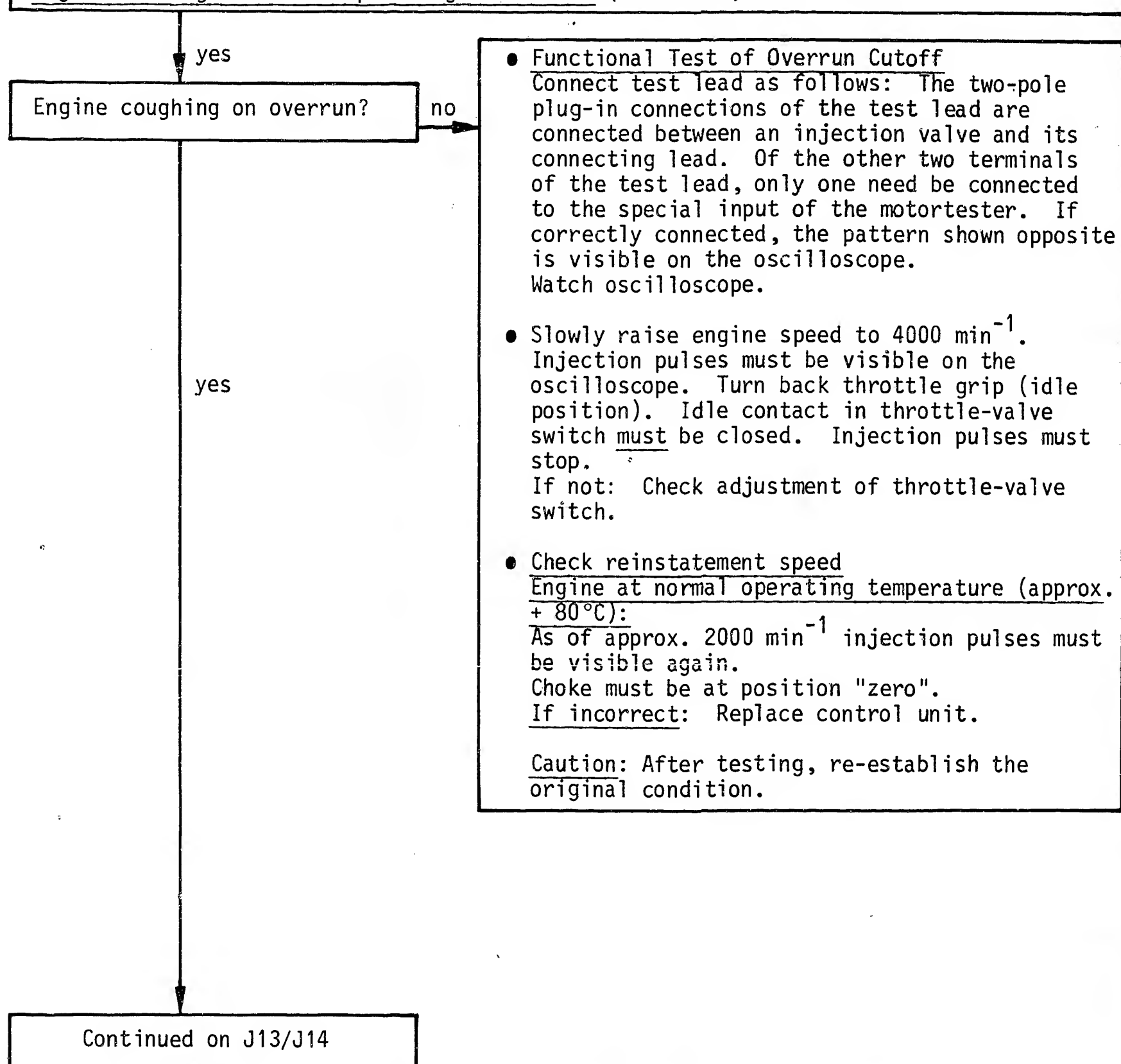


J10

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)



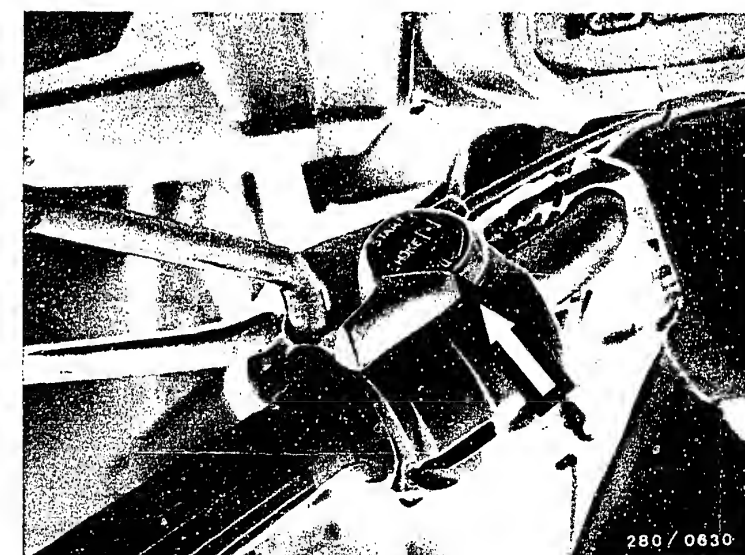
Injection pulse of a switched output stage

(Measured at the injection valve)

a=Pulse length

(Dependent on engine load)

Arrow=Choke in "zero" position



J11

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



J12

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

Idle speed and CO correctly adjusted?

Test Specification:

Idle speed:
 $900 \dots 1000 \text{ min}^{-1}$

CO concentration:
 $1.5 \dots 2.5 \text{ vol.\%CO}$

no

● Idle Speed and CO Adjustment

Exhaust-gas adjustment with exhaust-gas analyzer with engine at normal operating temperature and at idle speed.

Idle speed: $900 \dots 1000 \text{ min}^{-1}$

CO concentration: $1.5 \dots 2.5 \text{ vol.\%CO}$

The idle speed is adjusted at the idle speed stop screw (choke at "zero" setting). The idle mixture is adjusted by turning the bypass screw in the air-flow sensor (bore in top part of air filter sealed by rubber plug) with a hexagon-socket-screw key of size 5.

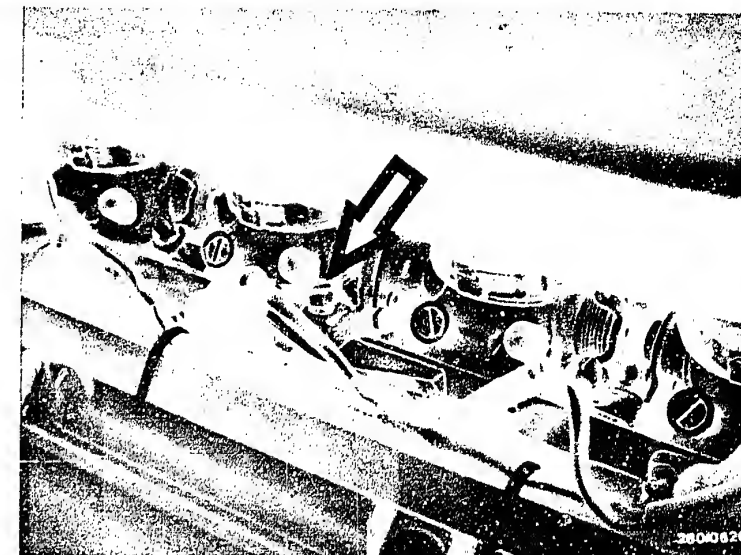
- If CO concentration too high, turn CO adjusting screw in air-flow sensor half a turn in a counterclockwise direction. Check idle speed and CO concentration again. If necessary, make corrections in several steps. After adjusting, use new, red plug (1 280 508 012).

yes

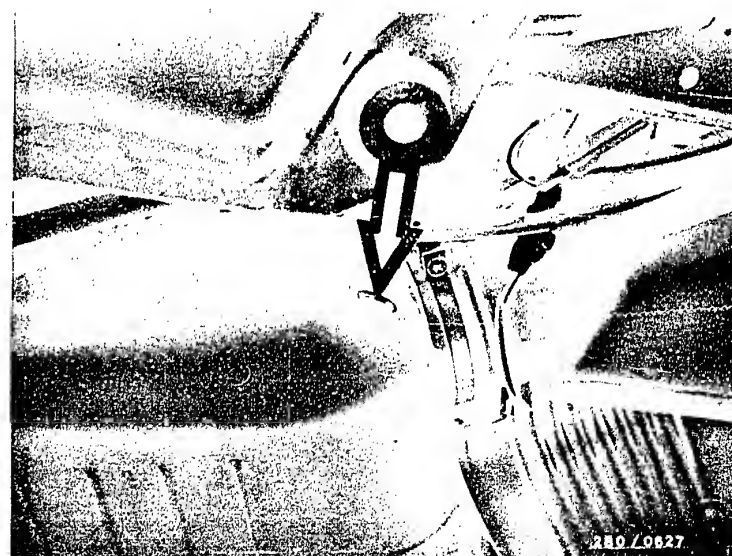
Idle speed not adjustable

yes

Continued on J15/J16



Arrow=Idle speed adjusting screw



Arrow=CO adjusting screw

J13

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100

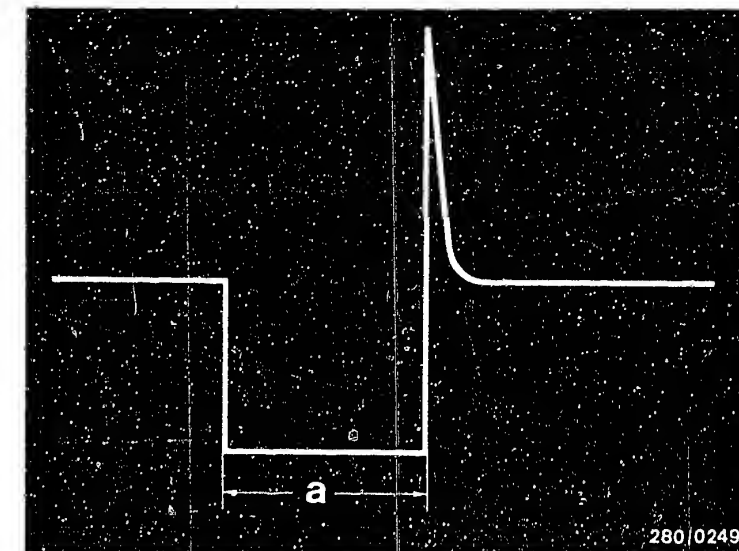
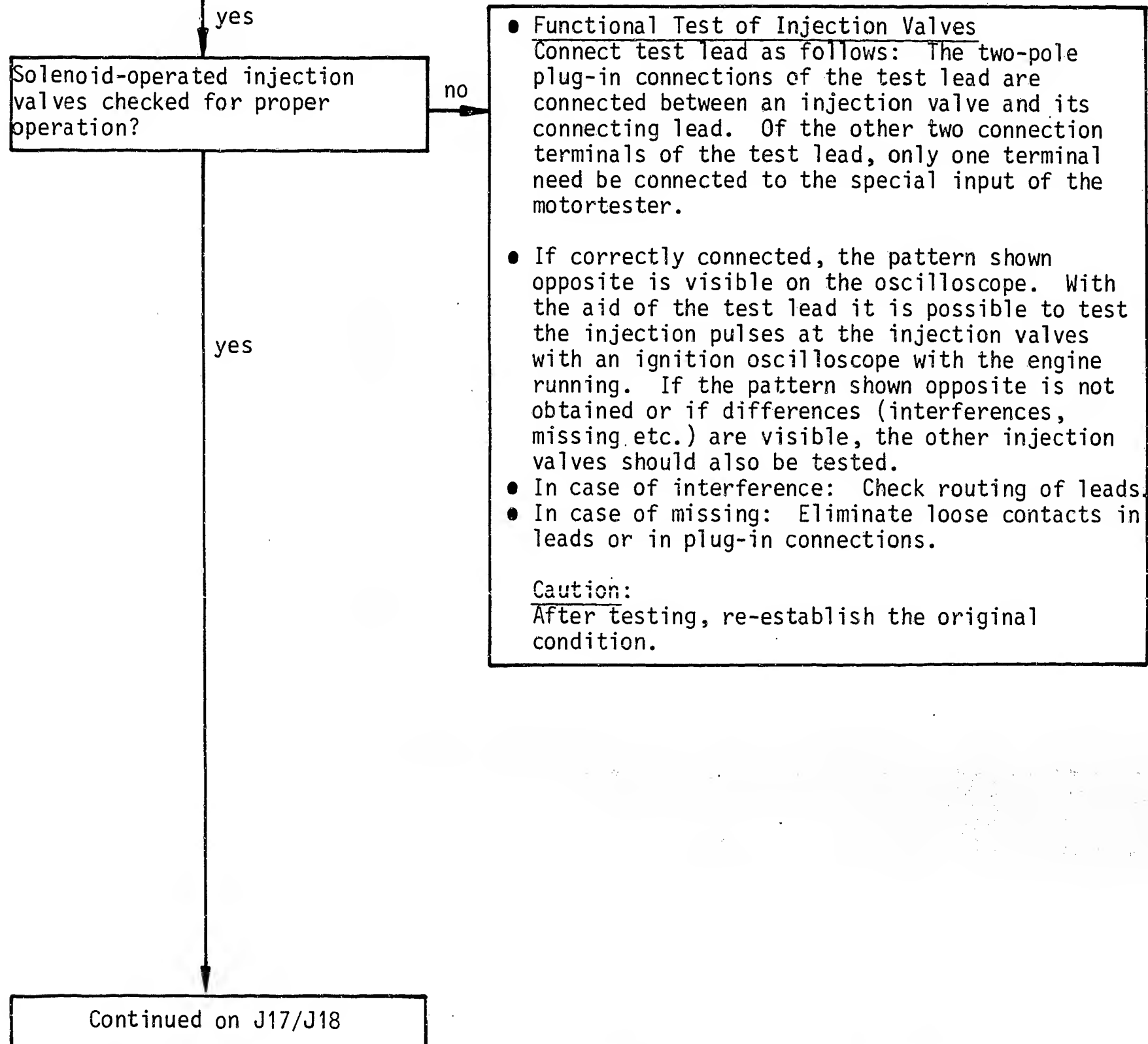


J14

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)



Injection pulses of a switched output stage (measured at the injection valve)
a=Pulse length (dependent on engine load)

J15

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



J16

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

Solenoid-operated injection valves mechanically O.K.?

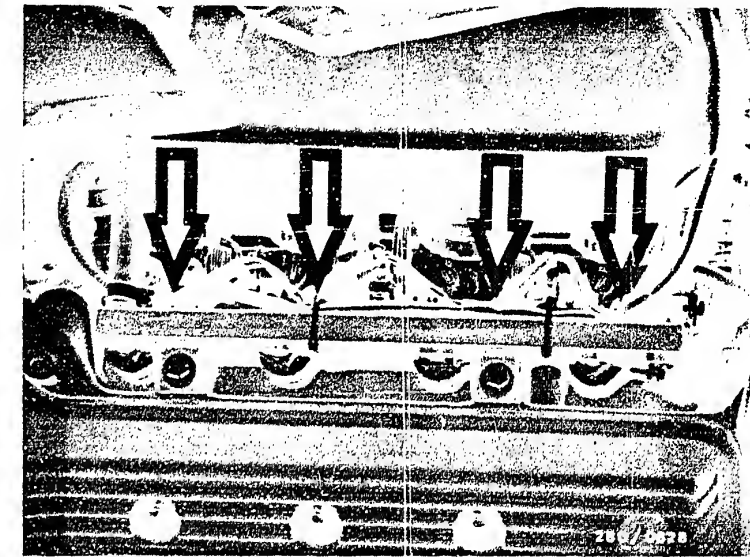
no

yes

- Mechanical Test of Injection Valves
With the engine running, disconnect injection-valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve O.K.
- Replacing the O-ring
Caution: If replacing injection valves, install injection valve ... 210 or ... 705, as the case may be. If injection valves functioning O.K. but O-rings defective, proceed as follows:
Remove fuel-distribution pipe.
Pull off electrical connection.
Carefully slide holding clamp out of groove and pull injection valve out of fuel-distribution pipe.
Caution: Catch any escaping fuel. Do not allow to drip onto hot parts of the engine.
Caution:
Protection sleeve must not be levered off.
Cut through lower O-ring (intake port).
Warning: Do not damage protection sleeve.
Fit new O-ring over protection sleeve and its bead. Do not damage any parts. Use parts set 1 287 010 704. Do not damage the needle when working on injection valves.

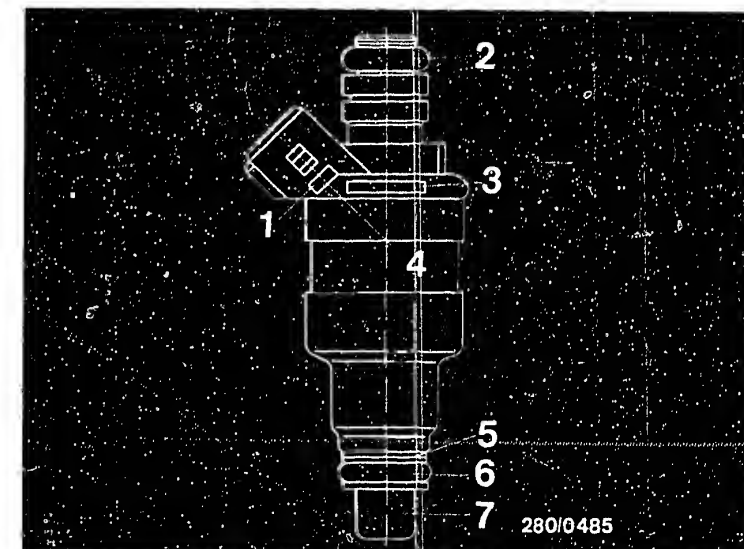
Continued on J19/J20

Continued on J19/J20



Arrows=Injection-valve connectors

- 1=FD Mark
- 2=Upper O-ring
- 3=Part number
- 4=Injection valve
- 5=Supporting plate
- 6=Lower O-ring
- 7=Protection sleeve



J17

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



J18

Engine Missing Under All Op. Conditions
BMW Motorcycle K 100



Engine Missing Under All Operating Conditions (continued)

yes

Trouble-shooting program completed for customer complaint

"Engine missing under all operating conditions"

Fault remedied?

no

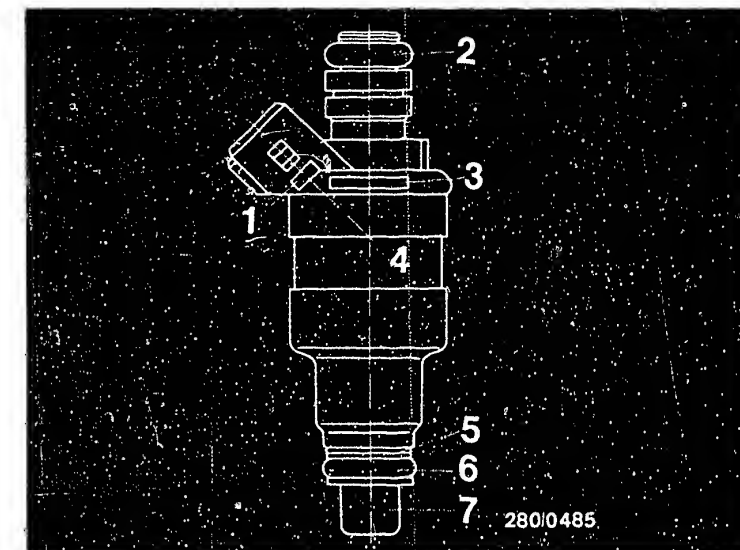
If the upper O-ring (connection to fuel-distribution pipe) is swollen or damaged, it must also be replaced.

Warning: Before installing, grease both O-rings only lightly (silicone grease F T 2 v 1). The other parts of the injection valves must remain grease-free.

Caution: After testing, re-establish the original condition.

Further Possibilities:

- Customer complaint incorrectly diagnosed. (See Coordinates C5...C8). If the fault has not been detected with the "direct trouble-shooting chart", see "detailed trouble-shooting chart" (Coordinates C3/C4)
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).



- 1=FD Mark
- 2=Upper O-ring
- 3=Part Number
- 4=Injection valve
- 5=Supporting plate
- 6=Lower O-ring
- 7=Protection sleeve



FUEL CONSUMPTION TOO HIGH

Trouble-shooting program according to customer complaint

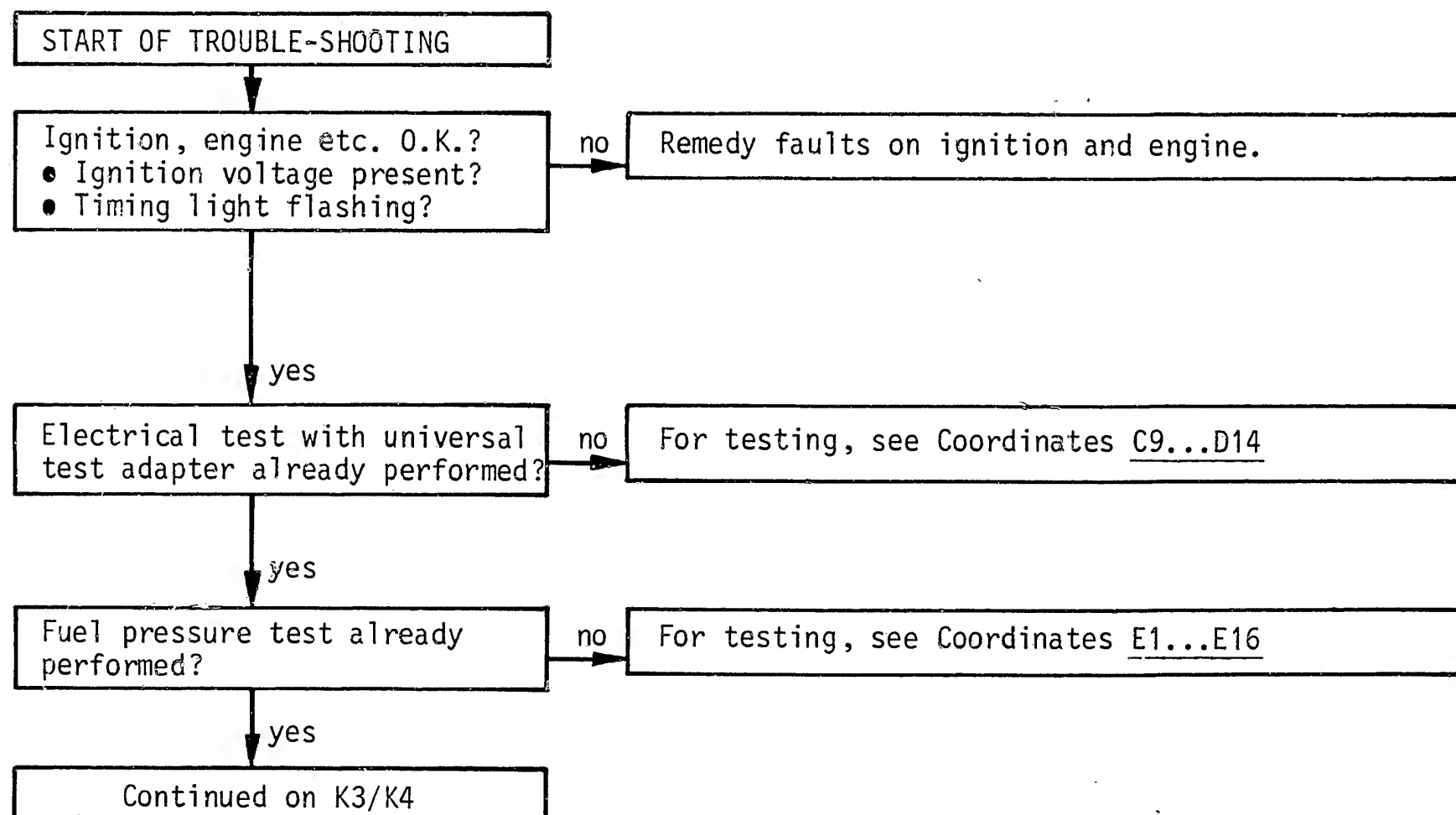
Procedure

The test is divided into 3 rows of boxes:

- The left-hand row contains the questions for the tests.
- The center row describes the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.

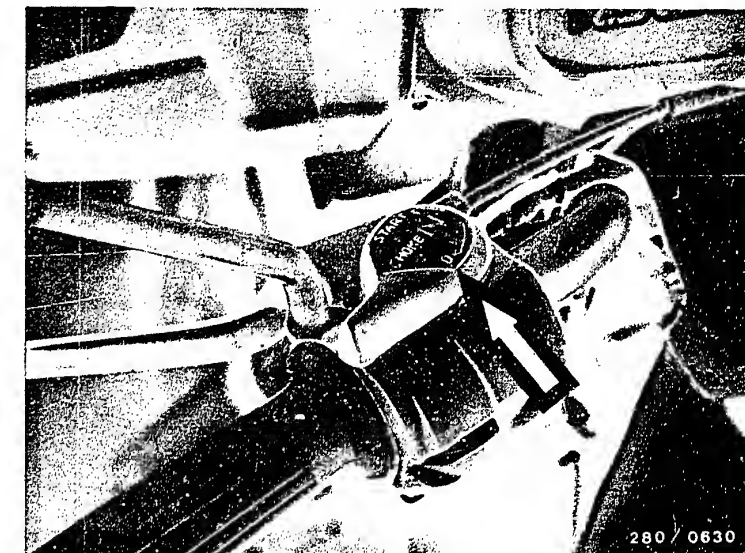
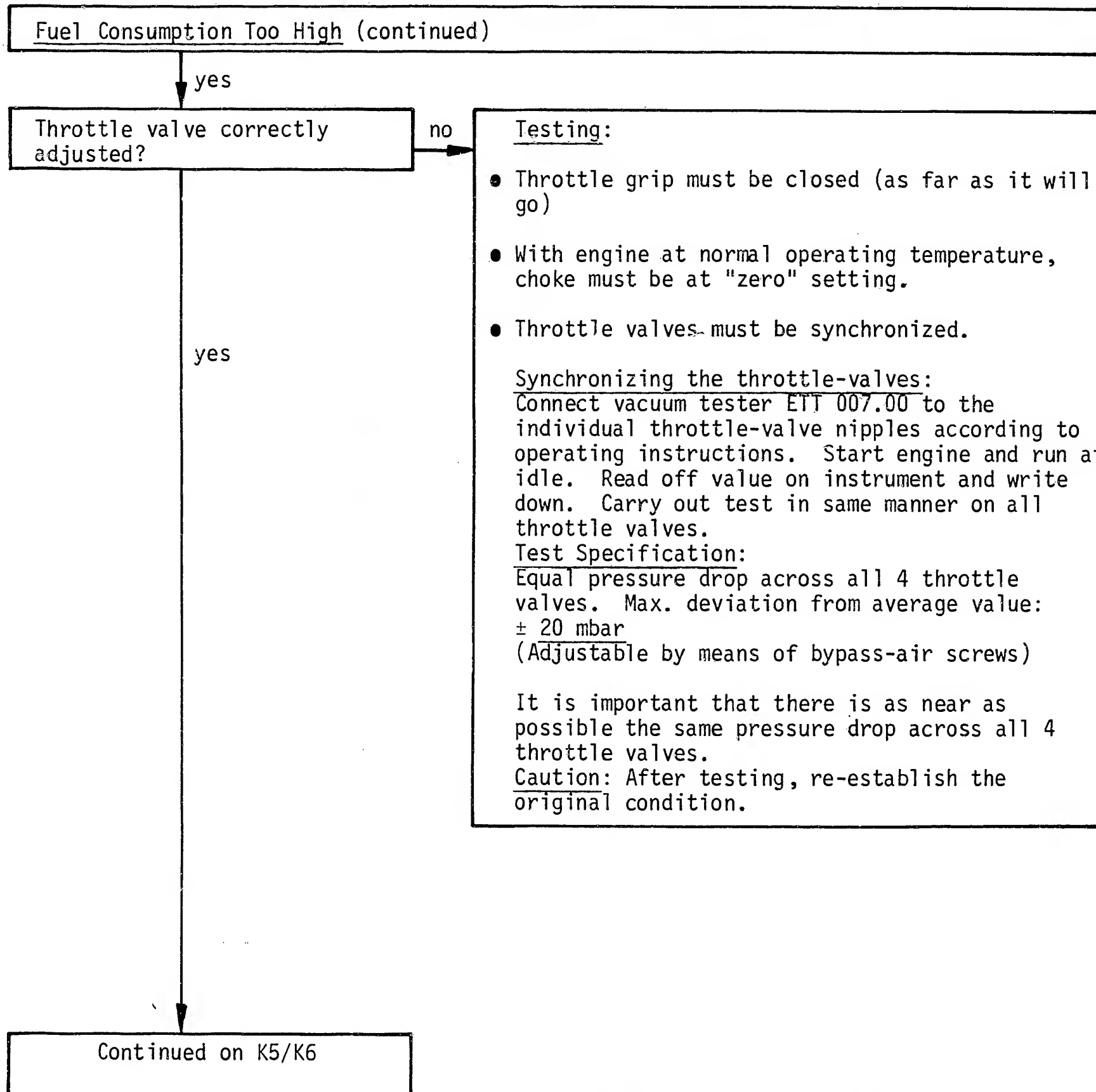
**K1**

Fuel Consumption Too High
BMW Motorcycle K 100

**K2**

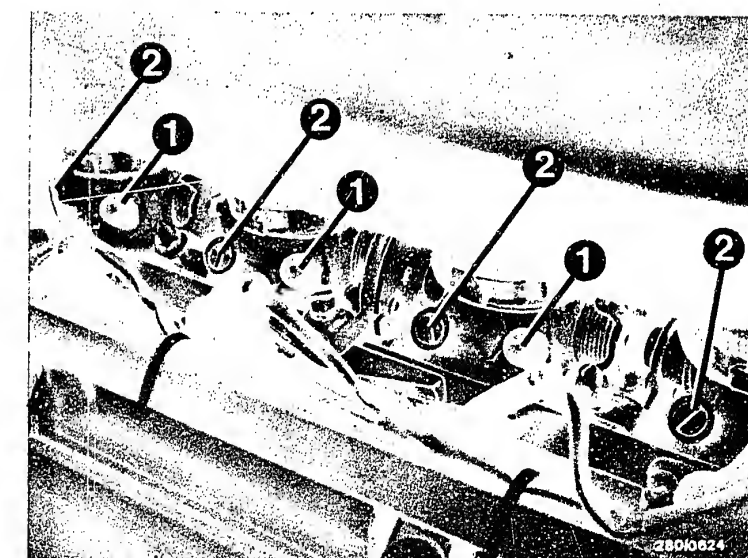
Fuel Consumption Too High
BMW Motorcycle K 100





Arrow=Choke in position "0"

1=Throttle-valve nipple
2=Bypass-air screw



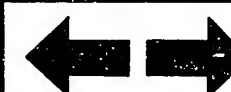
K3

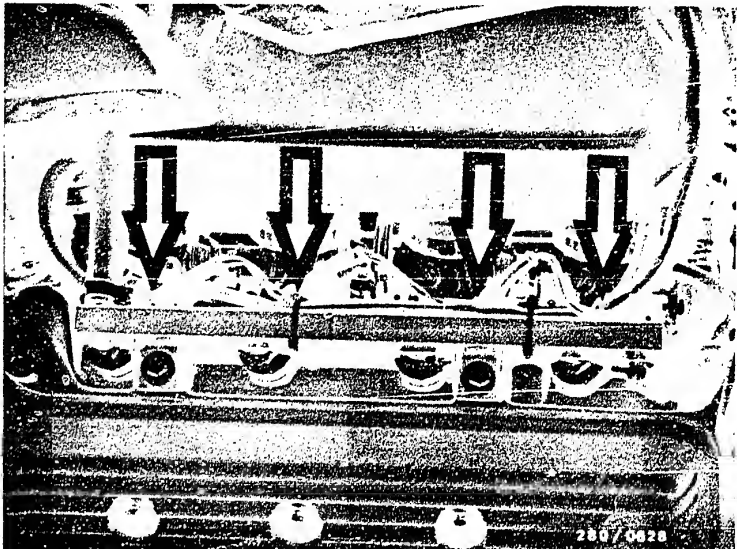
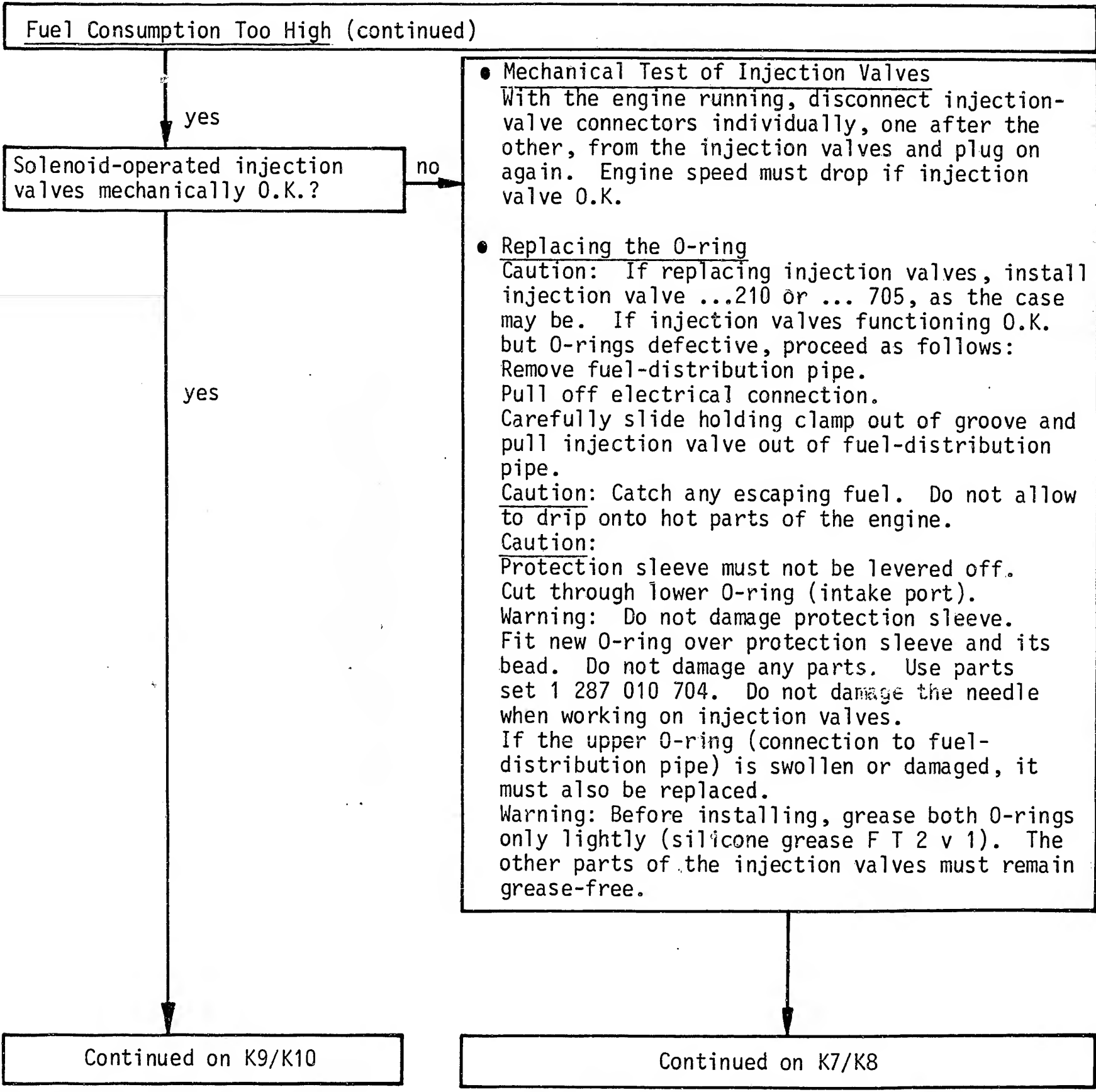
Fuel Consumption Too High
BMW Motorcycle K 100



K4

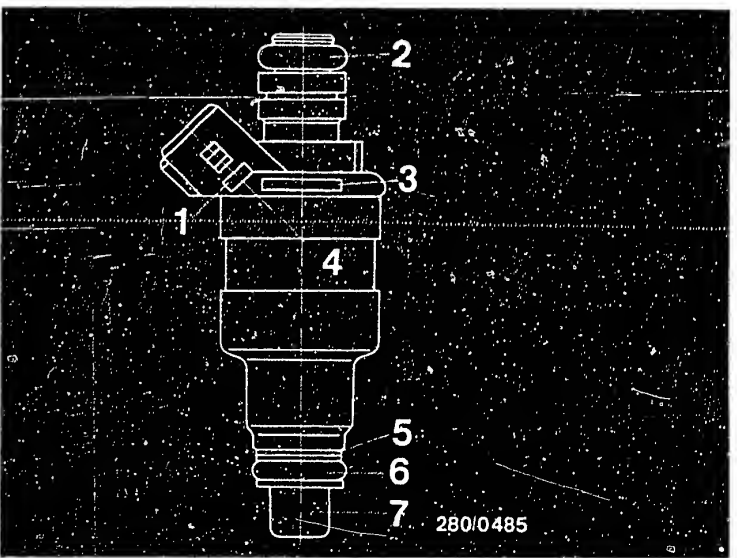
Fuel Consumption Too High
BMW Motorcycle K 100





Arrows=Injection-valve connectors

- 1=FD Mark
- 2=Upper O-ring
- 3=Part Number
- 4=Injection valve
- 5=Supporting plate
- 6=Lower O-ring
- 7=Protection sleeve



Fuel Consumption Too High (continued)

yes

● Leak-test on Injection Valves

Removing the fuel-distribution pipe:
Loosen fastening screws. Pull all 4 injection valves simultaneously and carefully out of the cylinder head.

Build up the fuel pressure:
Jump the safety circuit.

Caution:

Make sure that no fuel gets onto hot parts of the engine.

Test Specification:

Within 60 sec. no drop may fall from the mouth of the injection valve. If incorrect, replace injection valve.

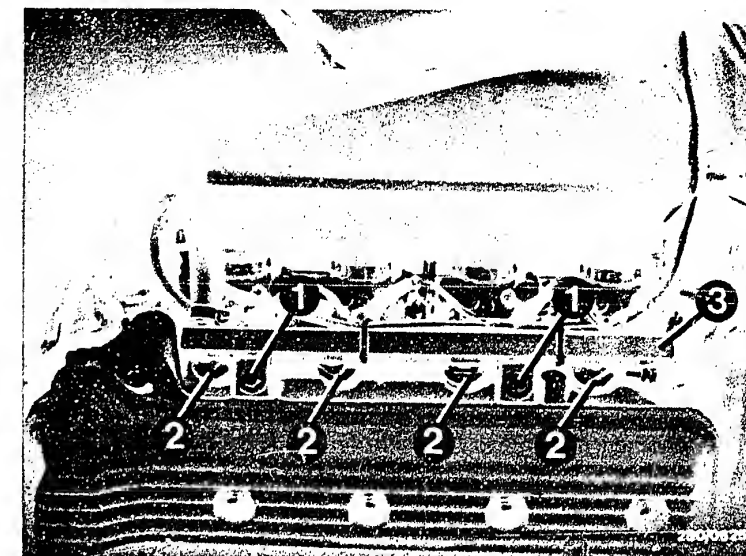
Disconnect electrical connection. Carefully slide holding clamp out of groove and pull injection valve out of fuel-distribution pipe.

Caution: Catch any escaping fuel. Do not allow to drip onto hot parts of the engine.

Warning:

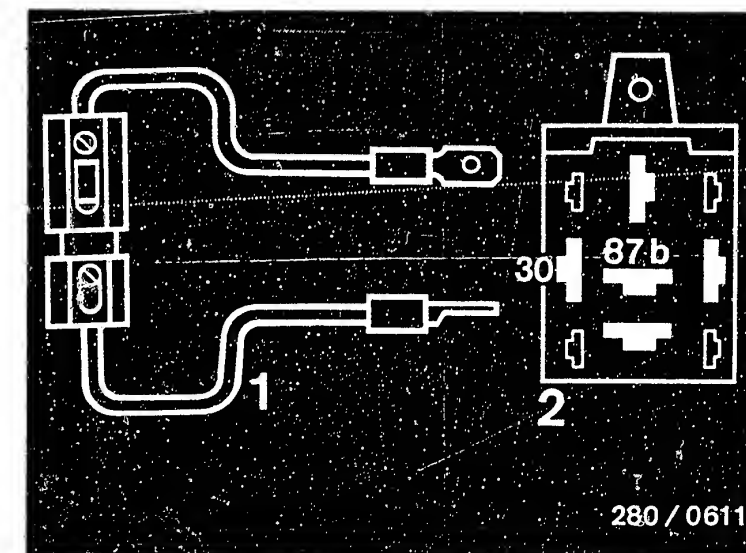
Before installing, grease both O-rings only lightly (silicone grease F T 2 v 1). The other parts of the injection valves must remain grease-free.

Caution: After testing, re-establish the original condition.



1=Fastening screws
2=Injection valve
3=Fuel-distribution pipe

1=Jumper with fuse holder and 10A fuse (user-fabricated)
2=Top view of connection base



Continued on K9/K10

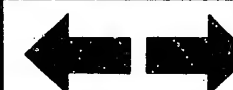
K7

Fuel Consumption Too High
BMW Motorcycle K 100



K8

Fuel Consumption Too High
BMW Motorcycle K 100



Fuel Consumption Too High (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

Resistance values within tolerance?

Between term. 8 and term. 9:

160...300 Ω

Between term. 7 and term. 5

(deflect air-flow sensor flap):

60...1000 Ω

no

Testing:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter.

• Checking the air-flow sensor flap for freedom of movement

Open air-flow sensor flap by hand. It must be possible to move the sensor flap with uniform ease from its fully open position to its fully closed position. When released, the sensor flap must close again fully by itself. Sensor flap must not catch when being opened.

• Mechanical test of air-flow sensor

For further testing, the air-flow sensor must be removed from the top part of the air filter (loosen 2 hexagon-socket-head capscrews and loosen hose to intake manifold). Watch for signs of rubbing. Clean air-flow sensor if very dirty inside and rub out with a lint-free cloth.

If there are signs of rubbing, replace air-flow sensor.

• Sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. Replace air-flow sensor.

• Testing the resistances

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: 160...300 Ω

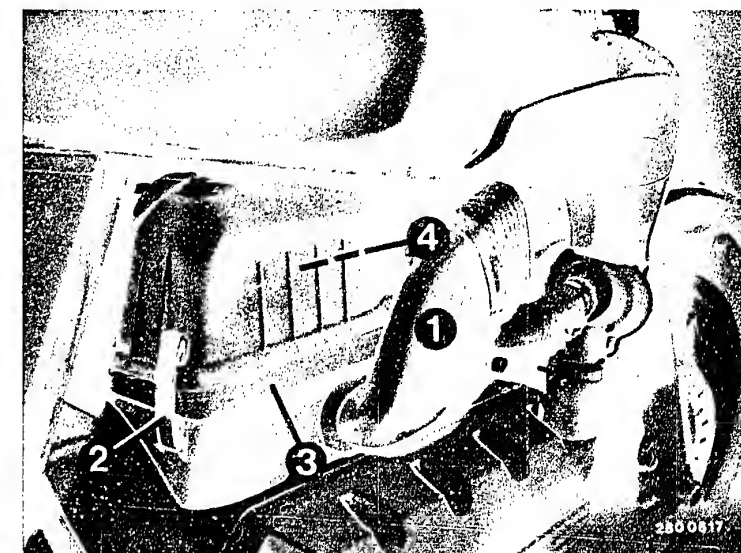
Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Deflect sensor flap.

Test specification: 60...1000 Ω

Caution: After testing, the air-flow sensor must be re-installed correctly. Re-establish the original condition.

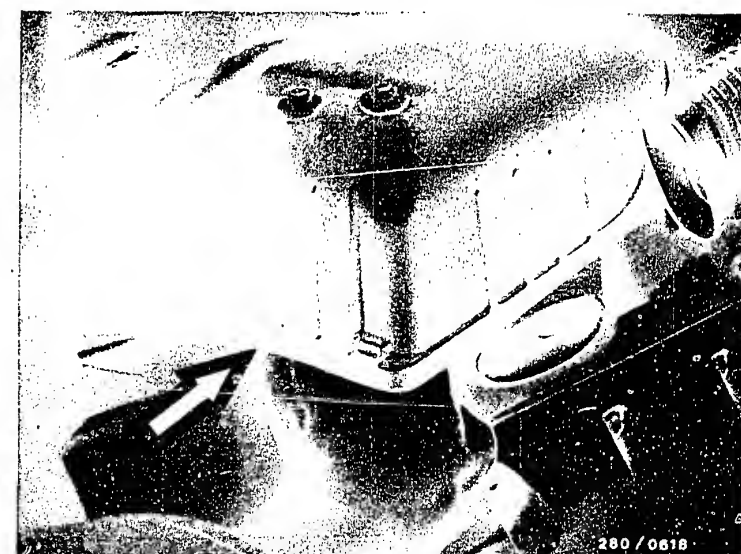
yes

Continued on K11/K12



1=Air guide
2=Snap-on fastener
3=Air filter
4=Air-flow sensor

Opening the air-flow sensor flap



K9

Fuel Consumption Too High
BMW Motorcycle K 100



K10

Fuel Consumption Too High
BMW Motorcycle K 100



Fuel Consumption Too High (continued)

yes

Idle speed and CO correctly adjusted?

Test Specification:

Idle speed:

900...1000 min⁻¹

CO concentration:

1.5...2.5 vol.%CO

no

● Idle Speed and CO Adjustment

Exhaust-gas adjustment with exhaust-gas analyzer with engine at normal operating temperature and at idle speed.

Idle speed: 900...1000 min⁻¹

CO concentration: 1.5...2.5 vol.%CO

The idle speed is adjusted at the idle-speed stop screw (choke at "zero" setting). The idle mixture is adjusted by turning the bypass screw in the air-flow sensor (bore in top part of air filter sealed by rubber plug) with a hexagon-socket-screw key of size 5.

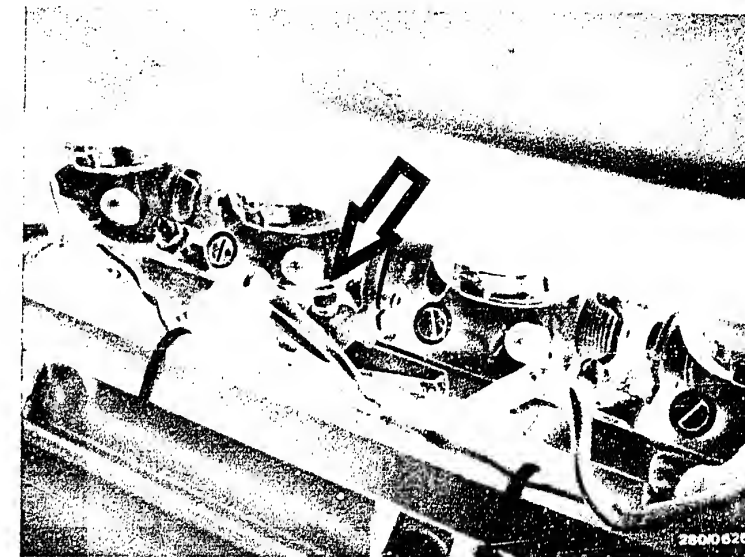
- If CO concentration too high, turn CO adjusting screw in air-flow sensor half a turn in a counterclockwise direction. Check idle speed and CO concentration again. If necessary, make corrections in several steps. After adjusting, use new, red plug (1 280 508 012).

yes

Idle speed not adjustable

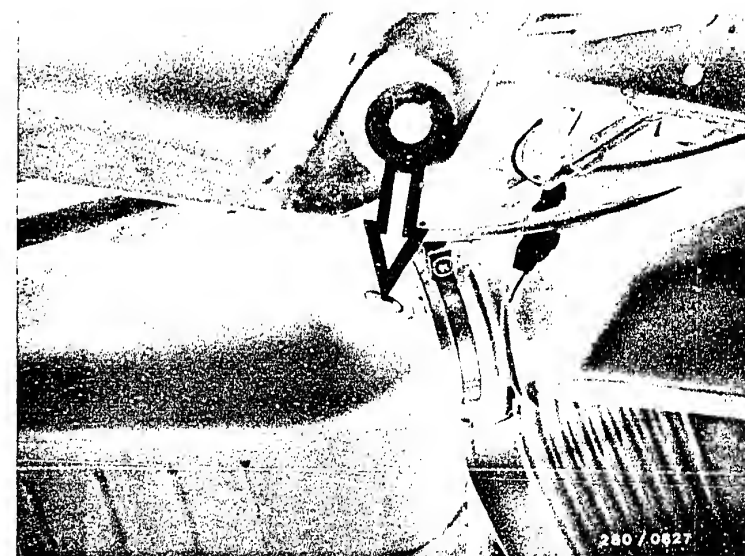
yes

Continued on K13/K14



Arrow=Idle-speed adjusting screw

Arrow=CO adjusting screw



K11

Fuel Consumption Too High
BMW Motorcycle K 100



K12

Fuel Consumption Too High
BMW Motorcycle K 100



Fuel Consumption Too High (continued)

yes

Trouble-shooting program
completed for customer
complaint
"Fuel consumption too high"
Fault remedied?

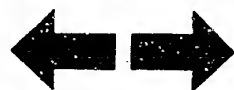
no

Further Possibilities:

- Customer complaint incorrectly diagnosed.
(See Coordinates C5...C8). If the fault has
not been detected with the "direct trouble-
shooting chart", see "detailed trouble-shooting
chart" (Coordinates C3/C4).
- Engine not mechanically O.K. (compression,
valve setting, valve timing, worn camshaft).

K13

Fuel Consumption Too High
BMW Motorcycle K 100



K14

Fuel Consumption Too High
BMW Motorcycle K 100



MAXIMUM ENGINE POWER/TOP SPEED NOT REACHED

Trouble-shooting program according to customer complaint

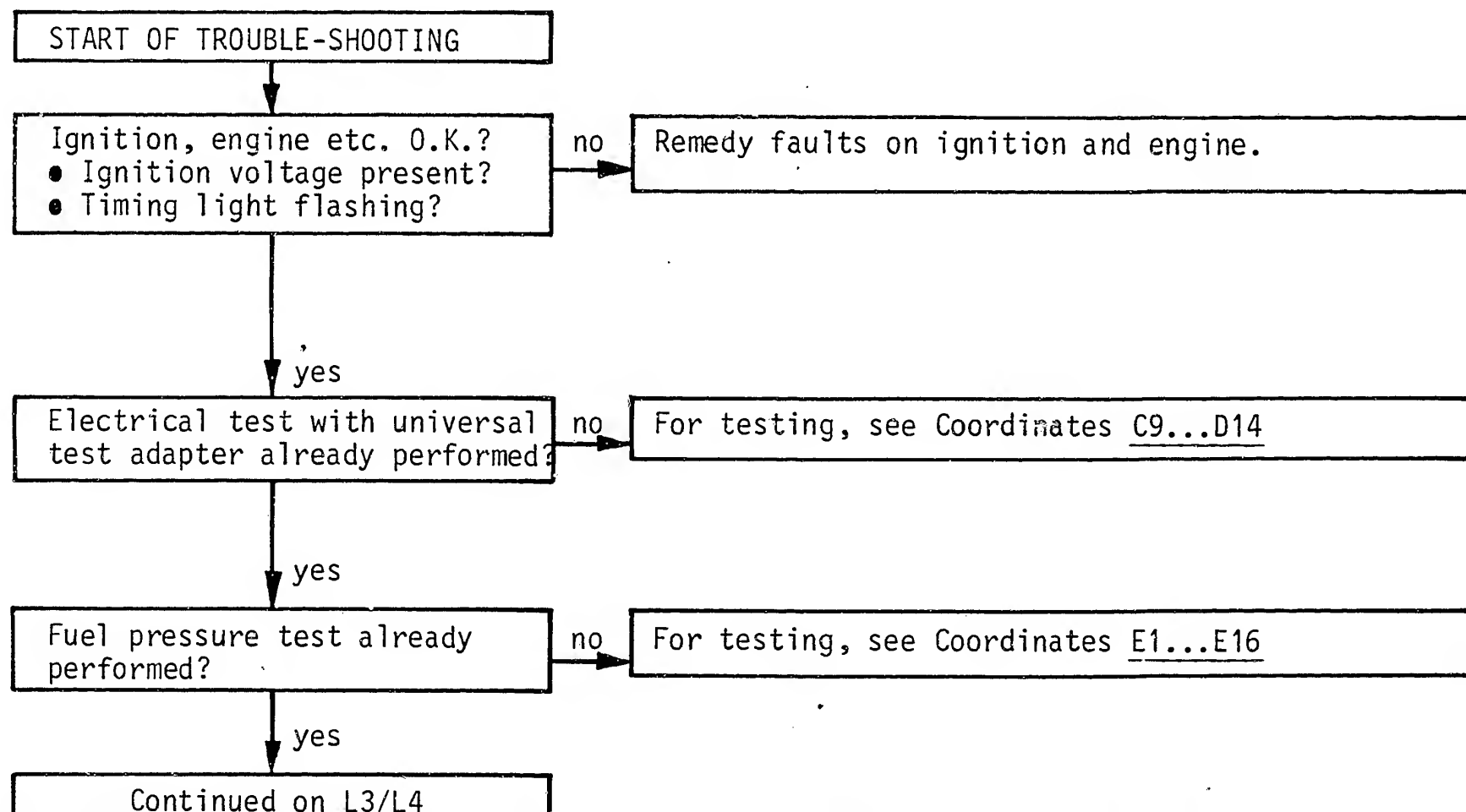
Procedure

The test is divided into 3 rows of boxes:

- The left-hand row contains the questions for the tests.
- The center row describes the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.



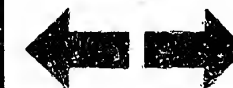
L1

No Maximum Engine Power
BMW Motorcycle K 100



L2

No Maximum Engine Power
BMW Motorcycle K 100



Maximum Engine Power/Top Speed Not Reached (continued)

yes

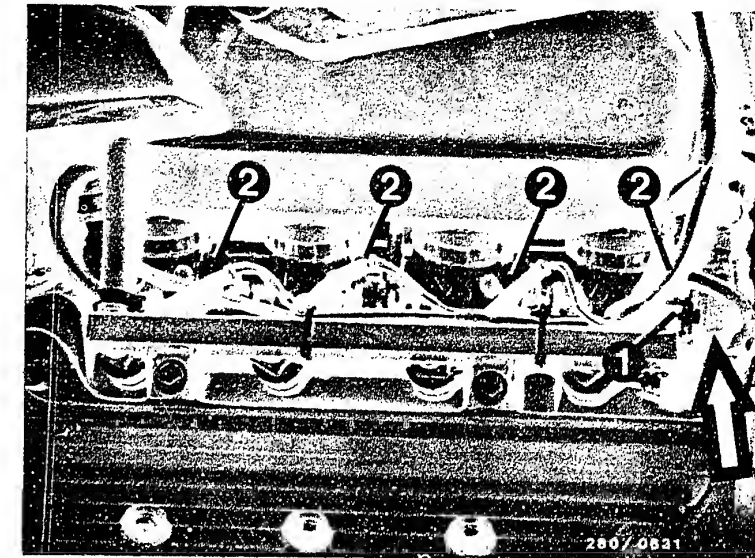
Are all throttle valves opening fully?

no

- Check operation of throttle grip and throttle cable.
- Throttle cable may stick.
- If throttle cable kinked or pinched - replace.

yes

Continued on L5/L6



Arrow=Throttle-valve switch
1=Throttle cable
2=Throttle valves

L3

No Maximum Engine Power
BMW Motorcycle K 100



L4

No Maximum Engine Power
BMW Motorcycle K 100



Maximum Engine Power/Top Speed Not Reached (continued)

yes

Throttle-valve switch O.K.?
Control unit O.K.?
(Full-load enrichment)

no

- Connect test lead as follows:
One terminal of the test lead is connected between an injection valve and its connecting leads. Of the other two connection terminals, only one terminal need be connected to the special input of the motortester.

Caution:

The other terminal must not come into contact with vehicle ground.

- If correctly connected, the pattern shown opposite is visible on the oscilloscope. Using the test lead, it is possible to check the injection pulses at the injection valves with an ignition oscilloscope with the engine running.

- Checking the full-load enrichment

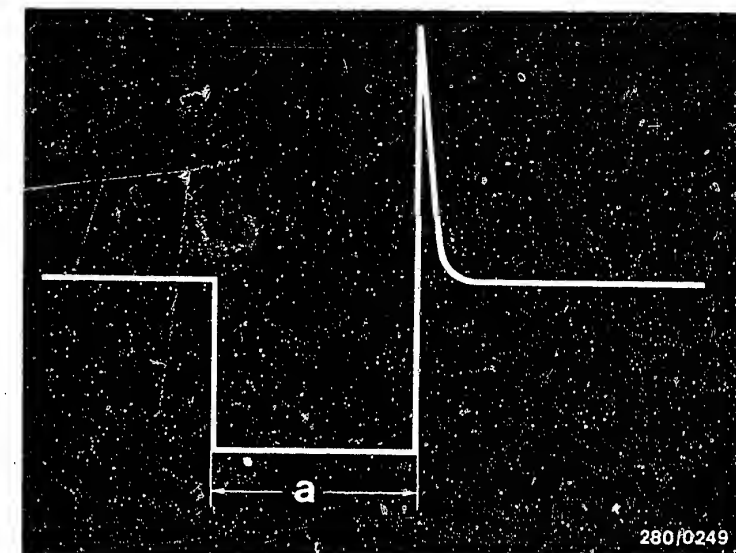
Watch injection pulses at idle. Disconnect throttle-valve switch plug and jump term. 3 and term. 18 (insulated wire jumper).

Caution:

Do not bend any contacts. Injection pulse must become longer for full-load enrichment. If not: check connecting leads between control-unit plug and throttle-valve switch (term. 3 and term. 18) for continuity. If O.K., replace control unit.
Caution: After testing, re-establish the original condition.

yes

Continued on L7/L8



Injection pulse of a switched output stage (measured at the injection valve)
a=Pulse length (dependent on engine load)

L5

No Maximum Engine Power
BMW Motorcycle K 100



L6

No Maximum Engine Power
BMW Motorcycle K 100



Maximum Engine Power/Top Speed Not Reached (continued)

yes

Fuel delivery of in-tank pump
O.K.?

Test specification:

min. 600 cm³/30s

Test specification reached?

no

Measuring the fuel delivery:

- Remove left-hand battery cover.
- Unhook radiator covers on left and right.
- Hinge up seat bench.
- Loosen fuel tank.
- Take off central-electrics box cover.
- Disconnect injection relay.
- Loosen connection between fuel tank and return hose. Extend hose, if necessary, and lead into a 5 l vessel with graduated scale. Insert jumper into injection-relay connection base between term. 87b and term. 30. In-tank pump must operate.

Test specification: min. 600 cm³/30s

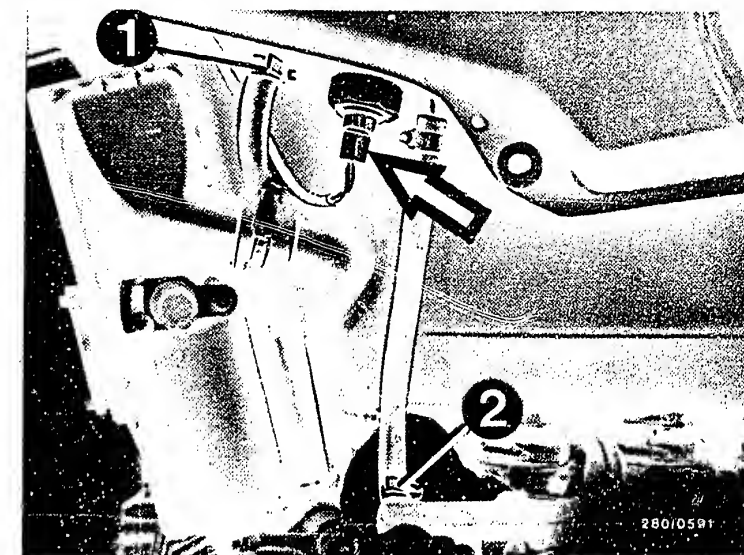
Remedy if test specification not reached:

- Fuel filter clogged - replace through tank filler neck.
Caution: Drain fuel tank before removing pump/filter. Be careful when handling fuels.
- Voltage at plug must be min. 12 V.
If not, clean contacts, possibly eliminate poor ground connection (under fuel tank on frame). Replace leads.

yes

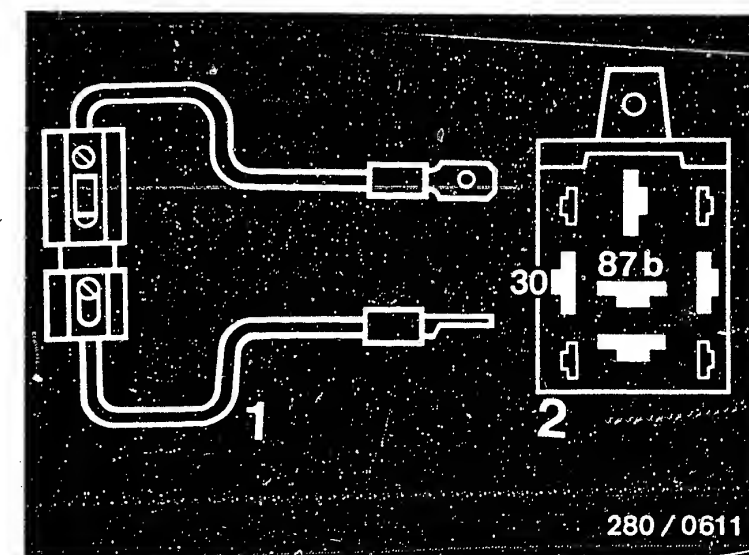
Continued on L11/L12

Continued on L9/L10



1,2 = Hose clamps
Arrow = Plug

1=Jumper with fuse holder and 10A fuse (user-fabricated)
2=Top view of connection base



L7

No Maximum Engine Power
BMW Motorcycle K 100



L8

No Maximum Engine Power
BMW Motorcycle K 100



Maximum Engine Power/Top Speed Not Reached (continued)

- Pressure regulator defective - replace.
- If fuel delivery too low, replace in-tank pump.
- If test specification reached immediately or fault eliminated and then test specification reached:
Remove jumper from connection base (must always be done immediately after measuring).
Connect injection relay and put cover on central-electrics box. Re-mount fuel tank and connect return hose to fuel tank and fasten. Lock seat bench. Hook in radiator covers on left and right and mount left-hand battery cover. Check fuel circuit for leaks.

yes

Continued on L11/L12

L9

No Maximum Engine Power
BMW Motorcycle K 100



L10

No Maximum Engine Power
BMW Motorcycle K 100



Maximum Engine Power/Top Speed Not Reached (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

Resistance values within tolerance?

Between term. 8 and term. 9:

160...300 Ω

Between term. 7 and term. 5 (deflect air-flow sensor flap):

60...1000 Ω

no

Testing:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter.

• Checking the air-flow sensor flap for freedom of movement

Open air-flow sensor flap by hand. It must be possible to move the sensor flap with uniform ease from its fully open position to its fully closed position. When released, the sensor flap must close again fully by itself. Sensor flap must not catch when being opened.

• Mechanical test of air-flow sensor

For further testing, the air-flow sensor must be removed from the top part of the air filter (loosen 2 hexagon-socket-head capscrews and loosen hose to intake manifold). Watch for signs of rubbing. Clean air-flow sensor if very dirty inside and rub out with a lint-free cloth. If there are signs of rubbing, replace air-flow sensor.

• Sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. Replace air-flow sensor.

• Testing the resistances

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: 160...300 Ω

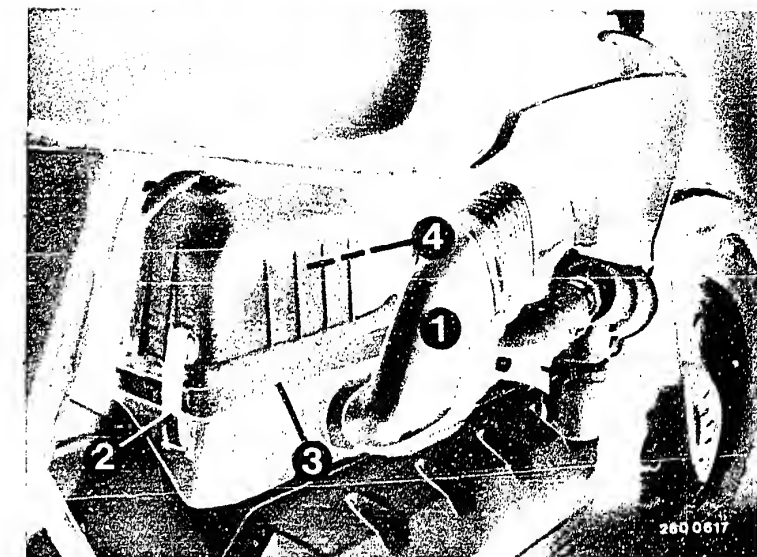
Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Deflect sensor flap.

Test specification: 60...1000 Ω

Caution: After testing is completed, the air-flow sensor must be re-installed correctly. Re-establish the original condition.

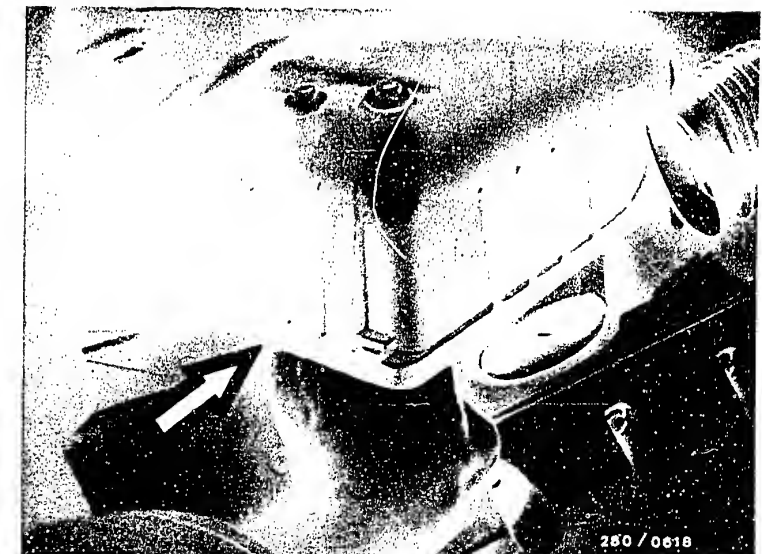
yes

Continued on L13/L14



1=Air guide
2=Snap-on fastener
3=Air filter
4=Air-flow sensor

Opening the air-flow sensor flap



L11

No Maximum Engine Power
BMW Motorcycle K 100



L12

No Maximum Engine Power
BMW Motorcycle K 100



Maximum Engine Power/Top Speed Not Reached (continued)

yes

All hose lines correctly connected, not kinked or damaged? Visual examination.

Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

- Check whether hoses of air-intake system and of fuel line system are correctly connected, not kinked or damaged. If necessary, replace hoses. Remedy leaks by means of new seals or by re-tightening the connecting screws.

- **Leak Test:**

Seal off exhaust tail pipe.

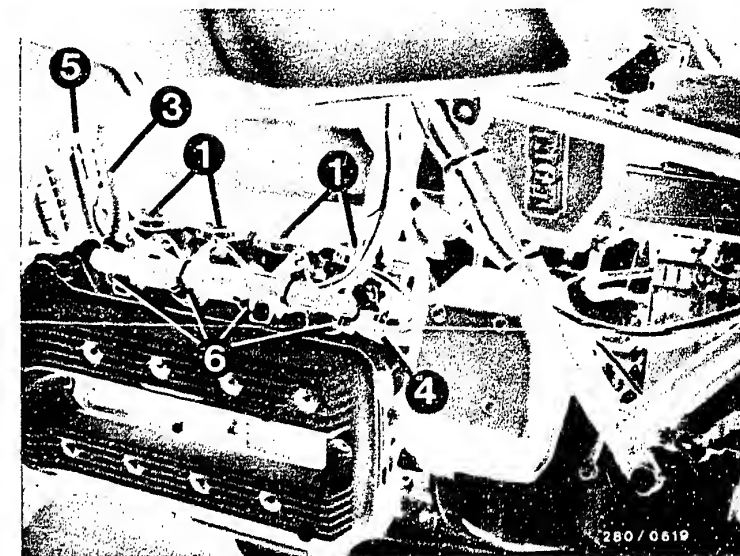
Disconnect air guide to air filter. Unscrew hose between air-flow sensor and intake manifold at air-flow sensor and seal off with a disc (user-fabricated). The disc should have a hole through which air (0.3 bar) can be blown in. Open throttle valve fully. Brush or spray all joints with soapy water. Leaks may also occur due to a defective cap seal on the oil filler neck etc.

Bubbling or foaming indicates a leak.

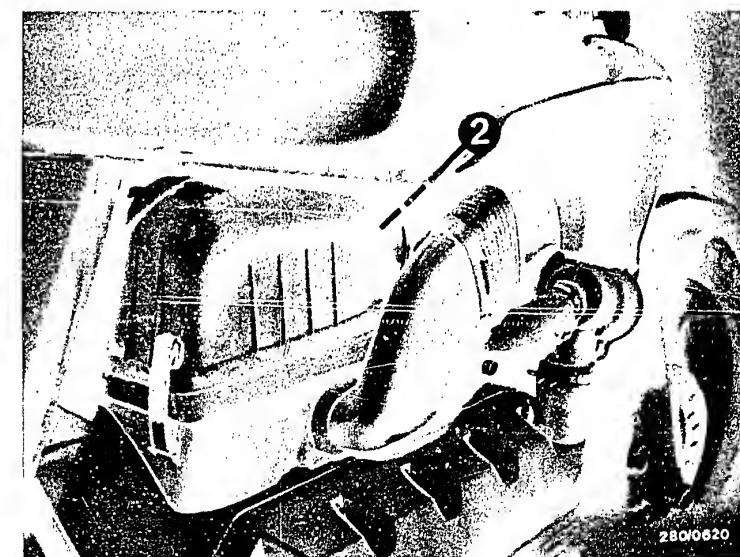
Caution: After testing, re-establish the original condition.

yes

Continued on L15/L16



- 1=Throttle-valve assembly
2=Hose between air-flow sensor and intake manifold
3=Hose between fuel tank and fuel-distribution pipe
4=Hose from fuel-distribution pipe to pressure regulator
5=Hose between pressure regulator and fuel tank
6=Injection valves



L13

No Maximum Engine Power
BMW Motorcycle K 100



L14

No Maximum Engine Power
BMW Motorcycle K 100



Maximum Engine Power/Top Speed Not Reached (continued)

yes

Trouble-shooting program
completed for customer
complaint

"Maximum engine power/top speed
not reached".

Fault remedied?

no

Further Possibilities:

- Customer complaint incorrectly diagnosed.
(See Coordinates C5...C8). If the fault has
not been detected with the "direct trouble-
shooting chart", see "detailed trouble-shooting
chart" (Coordinates C3/C4)
- Engine not mechanically O.K. (compression,
valve setting, valve timing, worn camshaft).

L15

No Maximum Engine Power
BMW Motorcycle K 100



L16

No Maximum Engine Power
BMW Motorcycle K 100



IDLE SPEED AND CO CONCENTRATION TOO LOW OR TOO HIGH

Trouble-shooting program according to customer complaint

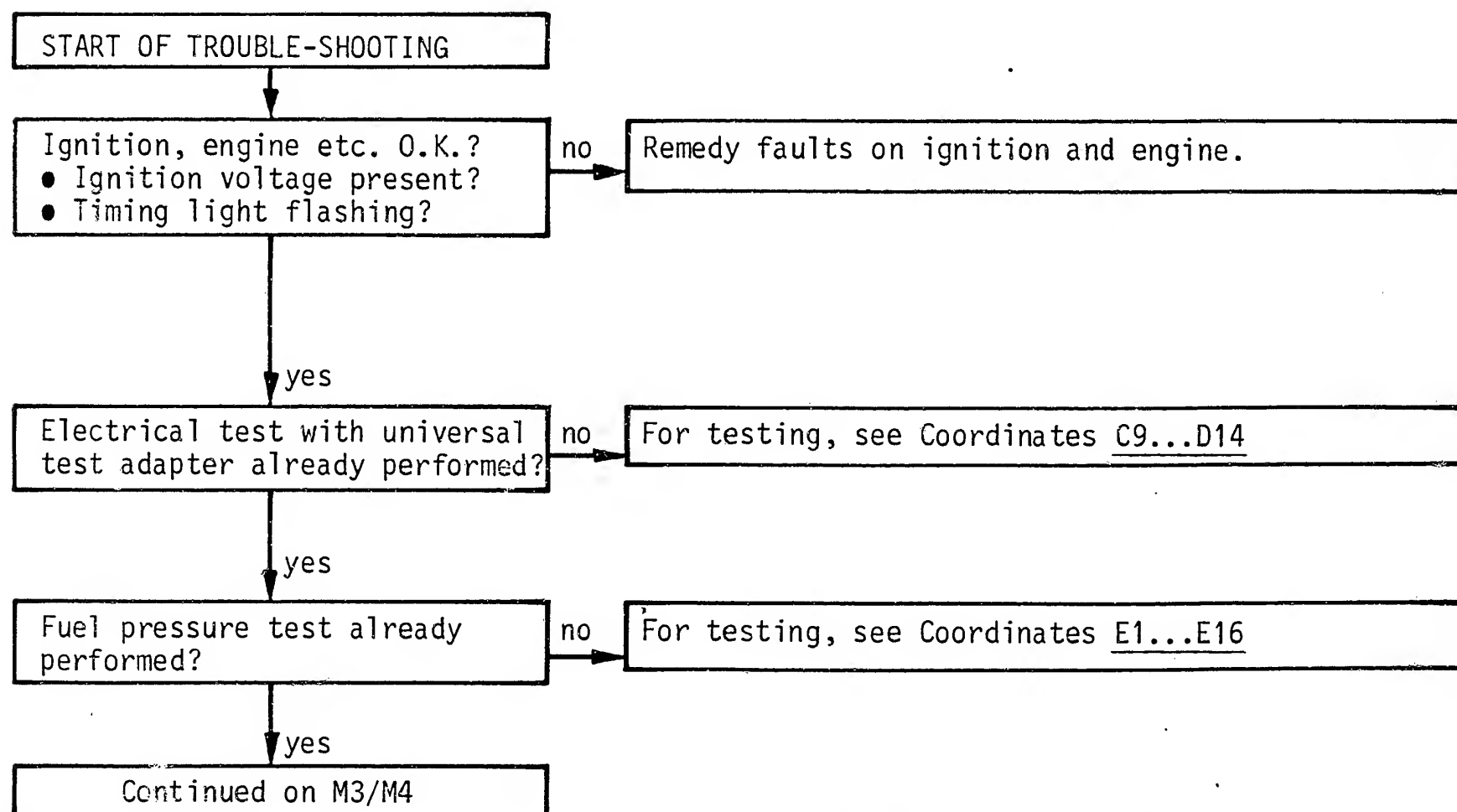
Procedure

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- The center row describes the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question down.

If, on the other hand, the answer to the question is "no" and you suspect a fault, branch to the center row of boxes and carry out the tests given there. After testing, continue trouble-shooting at the point at which you branched off.



M1

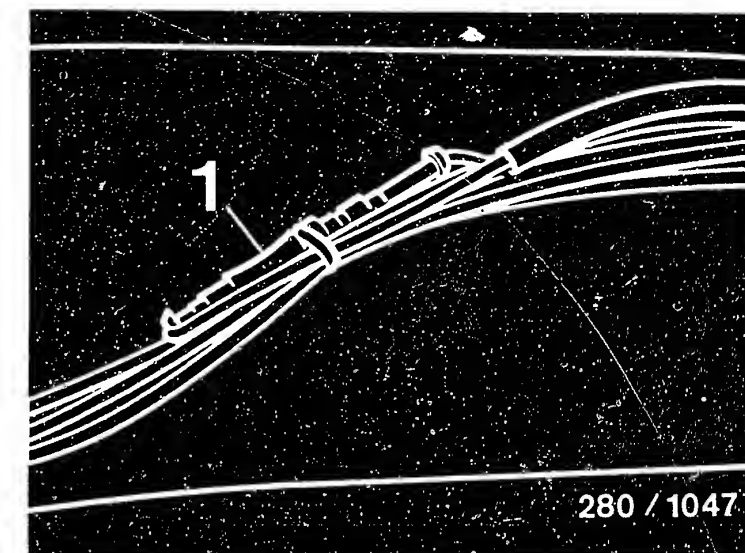
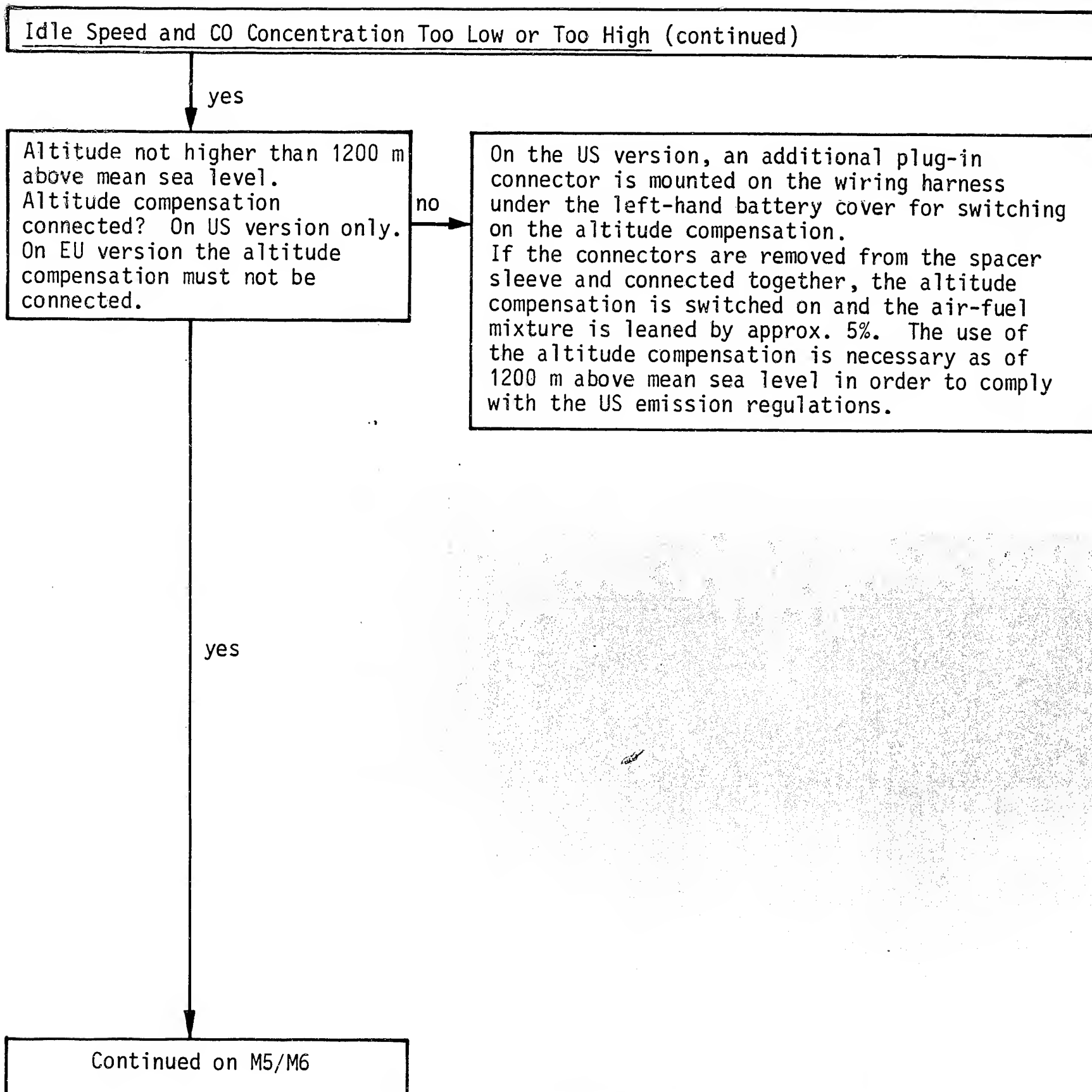
Idle Speed and CO Adjustment
BMW Motorcycle K 100



M2

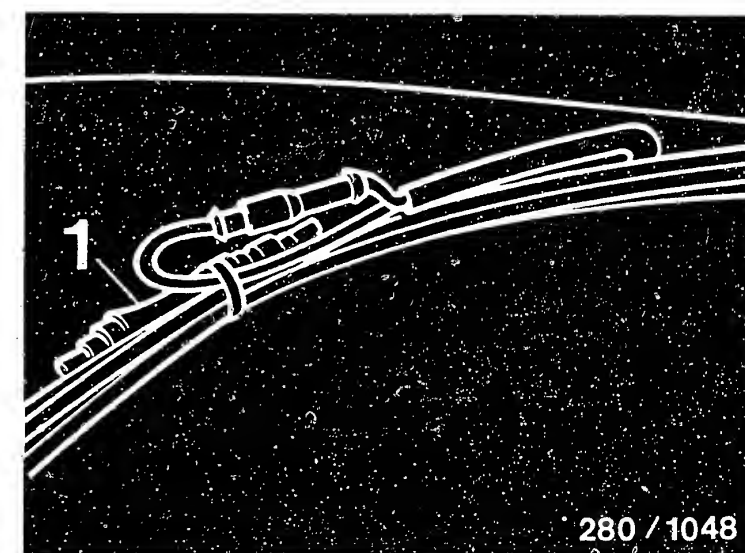
Idle Speed and CO Adjustment
BMW Motorcycle K 100

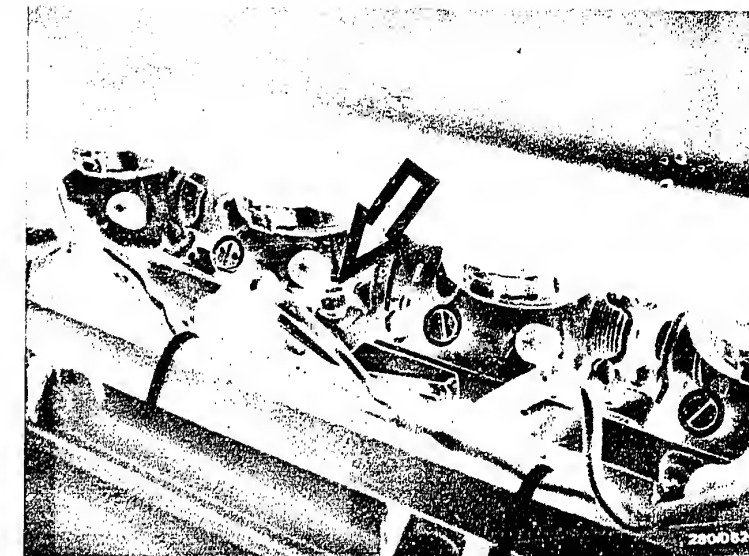
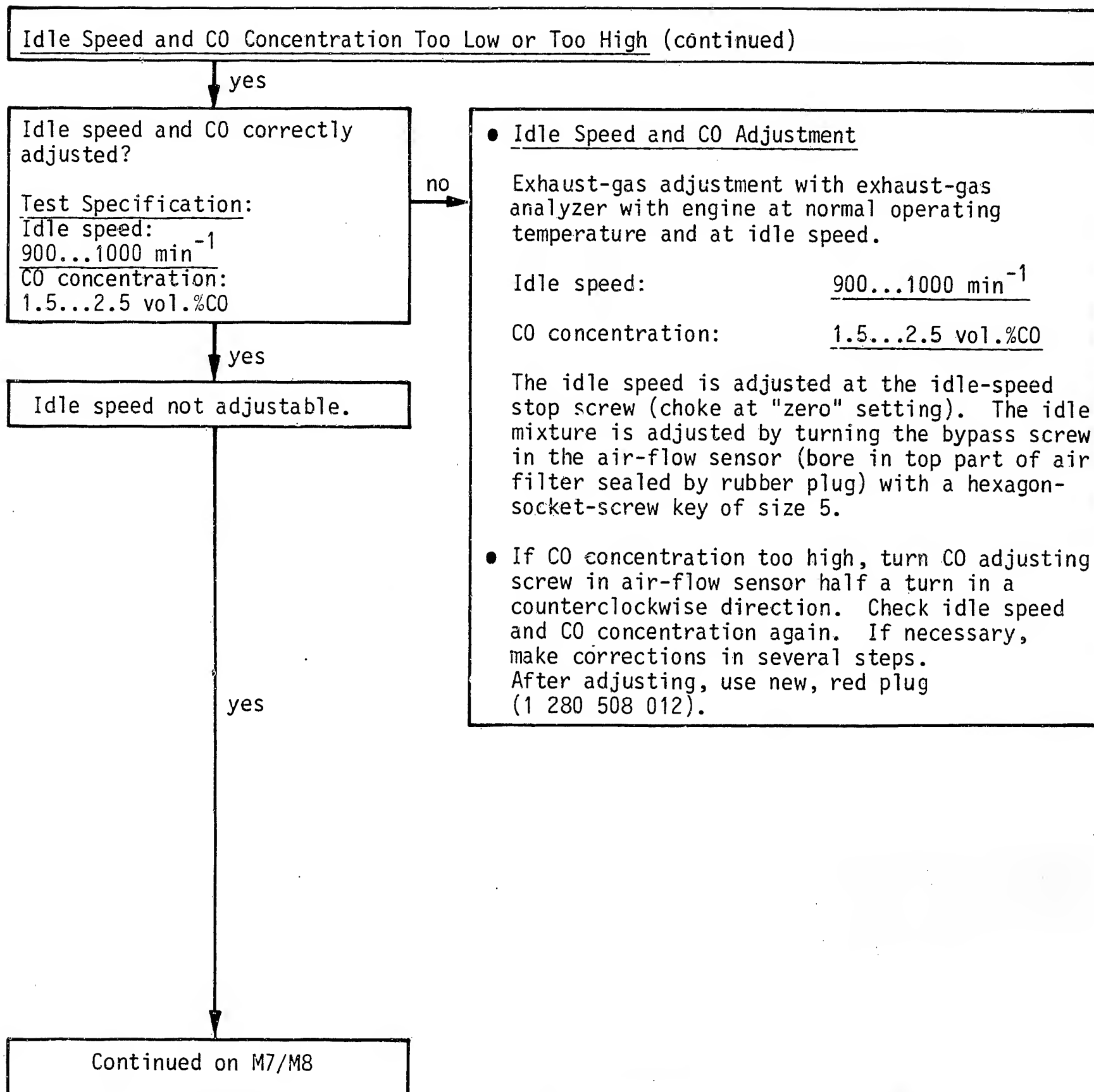




Plug-in connector
Altitude compensation not connected
1=Spacer sleeve

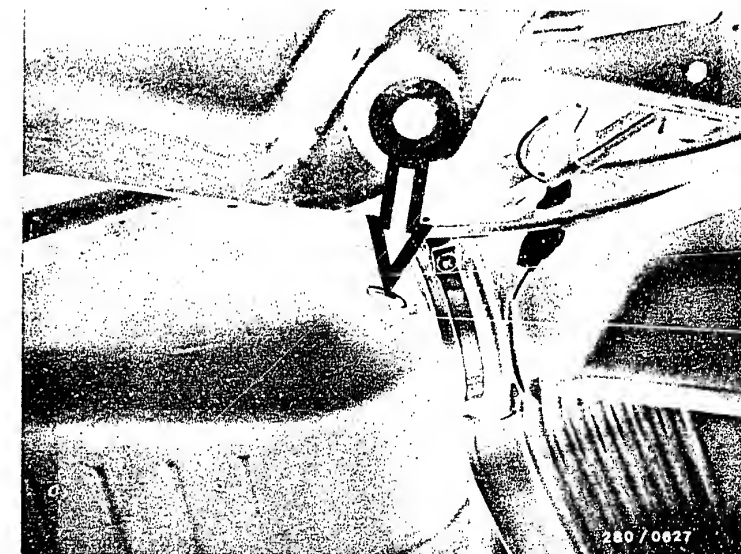
Plug-in connector
Altitude compensation connected
1=Spacer sleeve





Arrow=Idle-speed adjusting screw

Arrow=CO adjusting screw



M5

Idle Speed and CO Adjustment
BMW Motorcycle K 100



M6

Idle Speed and CO Adjustment
BMW Motorcycle K 100



Idle Speed and CO Concentration Too Low or Too High (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

Resistance values within tolerance?

Between term. 8 and term. 9:

160...300 Ω

Between term. 7 and term. 5

(deflect air-flow sensor flap):

60...1000 Ω

yes

Continued on M9/M10

no

Testing:

Loosen right-hand side cover. Disconnect air guide to air filter. Loosen three snap-on fasteners on air filter. Pull out air filter.

• Checking the air-flow sensor flap for freedom of movement

Open air-flow sensor flap by hand. It must be possible to move the sensor flap with uniform ease from its fully open position to its fully closed position. When released, the sensor flap must close again fully by itself. Sensor flap must not catch when being opened.

• Mechanical test of air-flow sensor

For further testing, the air-flow sensor must be removed from the top part of the air filter (loosen 2 hexagon-socket-head capscrews and loosen hose to intake manifold). Watch for signs of rubbing. Clean air-flow sensor if very dirty inside and rub out with a lint-free cloth. If there are signs of rubbing, replace air-flow sensor.

• Sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. Replace air-flow sensor.

• Testing the resistances

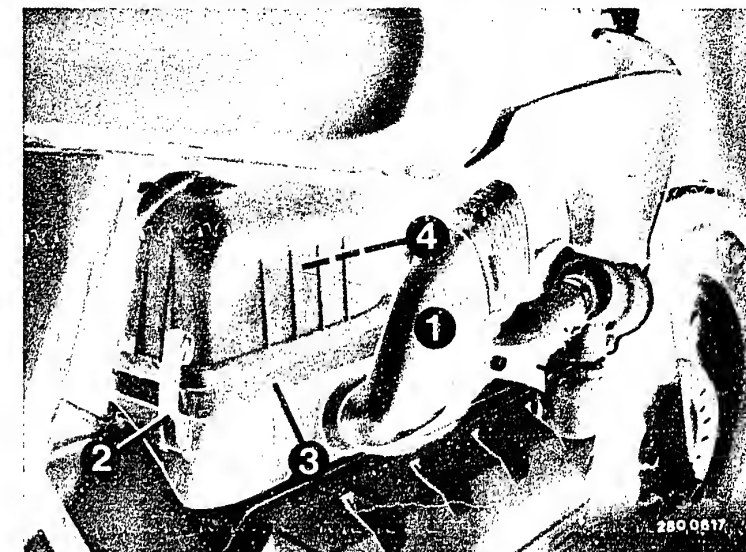
Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: 160...300 Ω

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Deflect sensor flap.

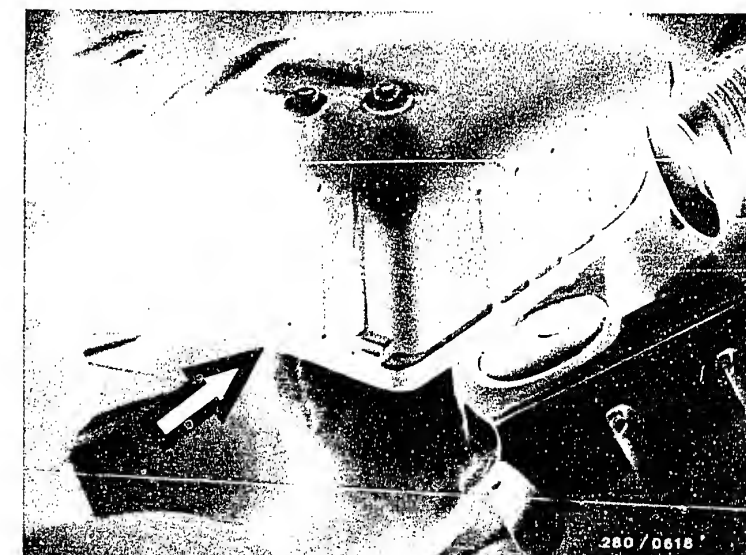
Test specification: 60...1000 Ω

Continued on M9/M10



- 1=Air guide
- 2=Snap-on fastener
- 3=Air filter
- 4=Air-flow sensor

Opening the air-flow sensor flap



M7

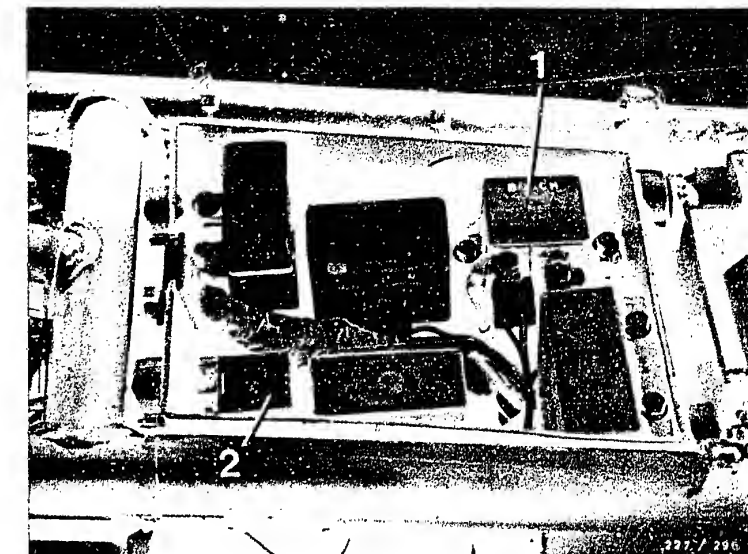
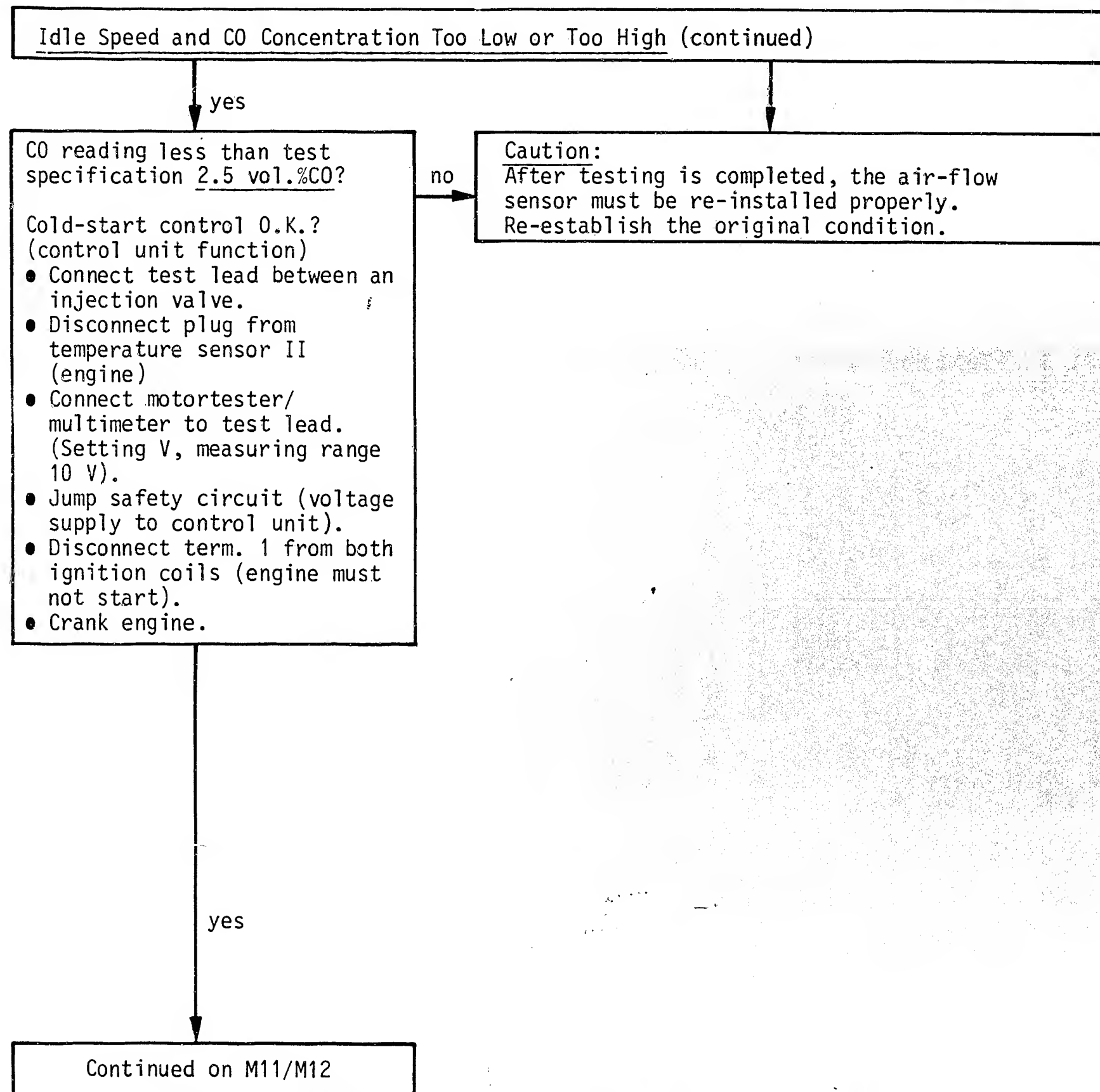
Idle Speed and CO Adjustment
BMW Motorcycle K 100



M8

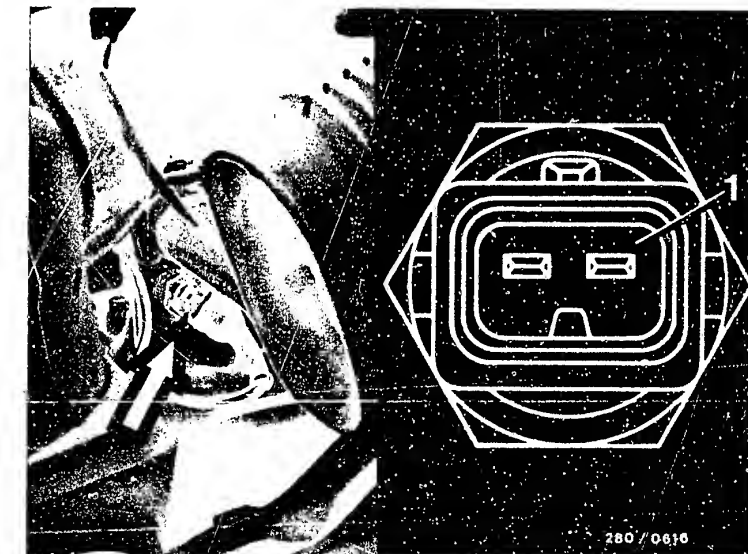
Idle Speed and CO Adjustment
BMW Motorcycle K 100





2=Injection relay

Arrow=Temperature sensor II (engine)
Top view of plug of temperature sensor for LE version (1)



M9

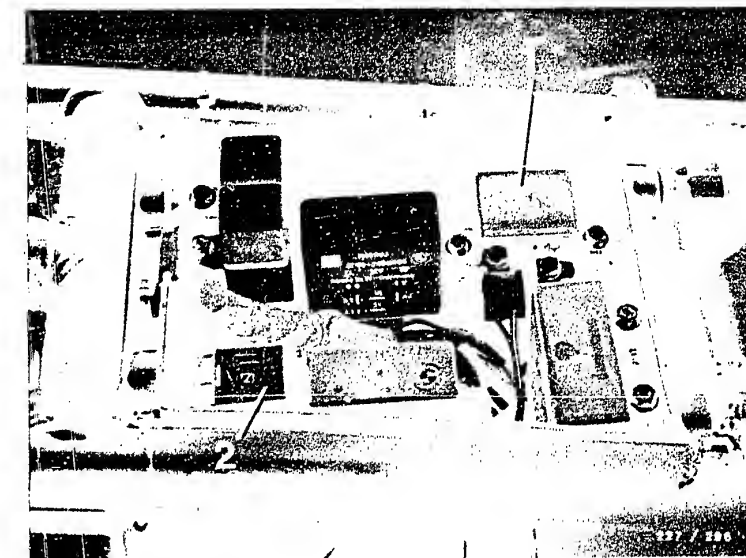
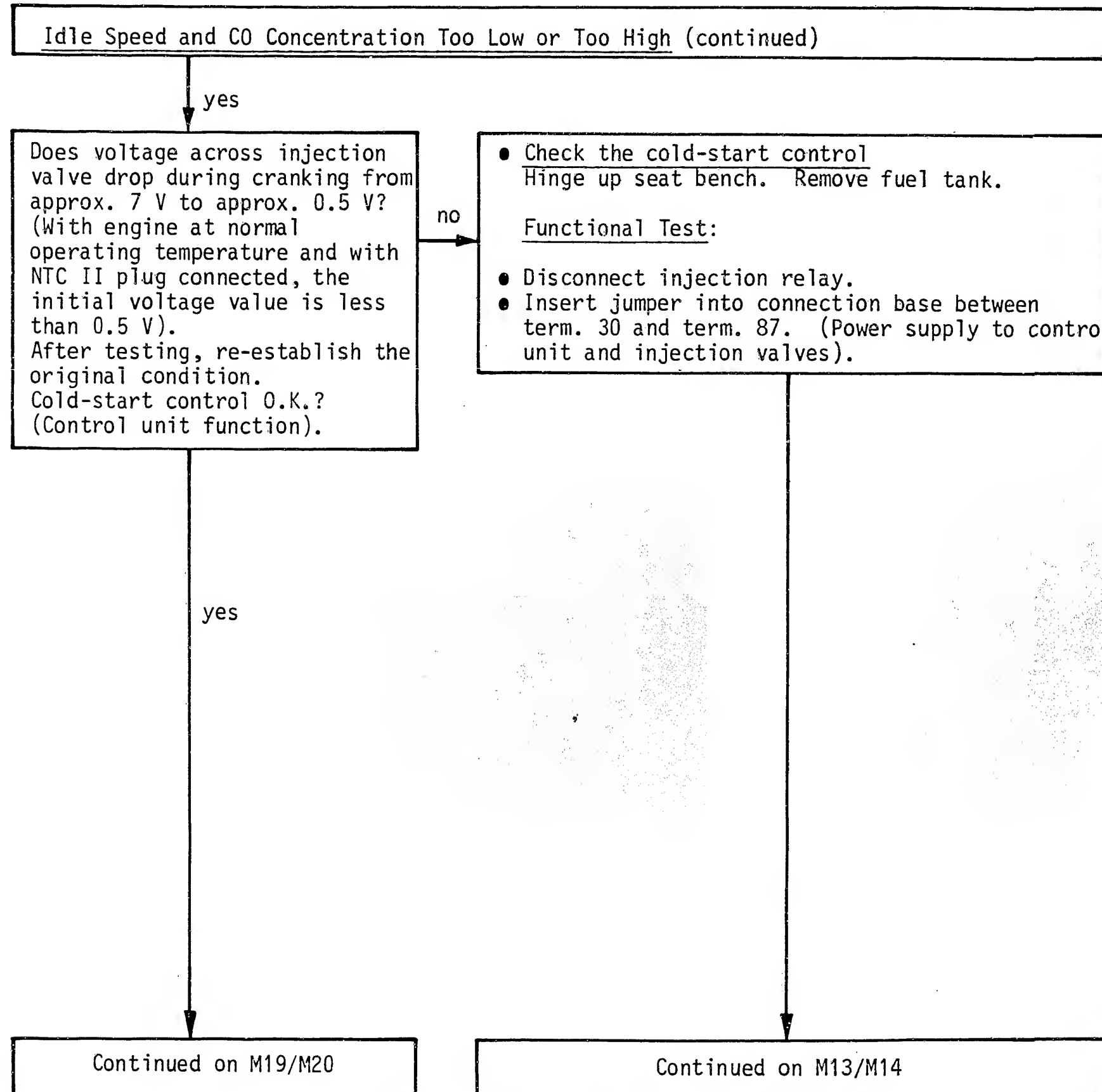
Idle Speed and CO Adjustment
BMW Motorcycle K 100



M10

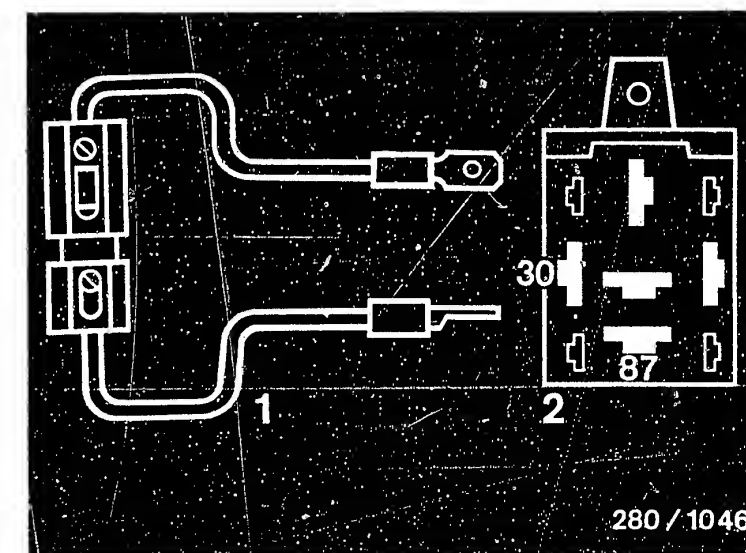
Idle Speed and CO Adjustment
BMW Motorcycle K 100





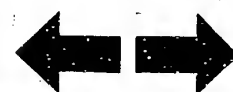
1=Injection relay

1=Jumper with fuse holder and 10 A fuse (user-fabricated)
2=Top view of connection base



M11

Idle Speed and CO Adjustment
BMW Motorcycle K 100



M12

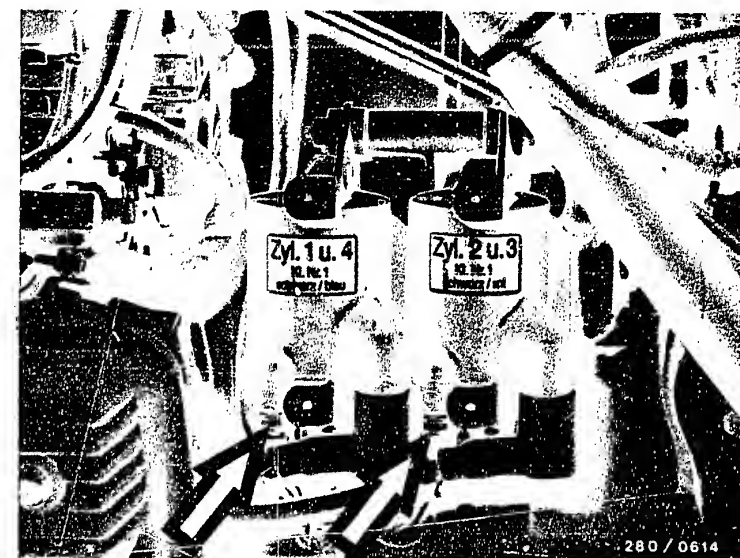
Idle Speed and CO Adjustment
BMW Motorcycle K 100



Idle Speed and CO Concentration Too Low or Too High (continued)

Disconnect lead term. 1 from both ignition coils.
Caution: Do not mix up term. 1 when connecting later.

Engine must not start when starting motor is operated.



Arrow=Connection terminal 1

yes

Continued on M19/M20

Continued on M15/M16

M13

Idle Speed and CO Adjustment
BMW Motorcycle K 100



M14

Idle Speed and CO Adjustment
BMW Motorcycle K 100



Idle Speed and CO Concentration Too Low or Too High (continued)

- Connect 2-pole adapter lead 1 684 463 093 between an injection valve and its electrical connecting lead.
- Connect multimeter to free measuring poles. Measuring range approx. 10 V.
- Disconnect plug from temperature sensor II (engine).

• Testing:

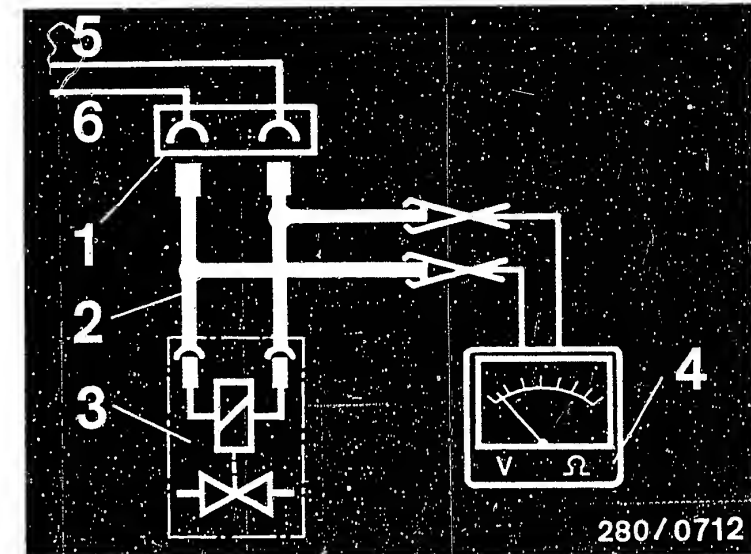
- Start engine
- Voltage reading drops from initially approx. 7 V within approx. 15 s cranking time to approx. 0.5 V.
If voltage values not reached, replace control unit.
- Wait approx. 1 minute before repeating voltage test.
- Connect plug to temperature sensor. If engine at normal operating temperature, start. Voltage reading less than 0.5 V. If not, replace temperature sensor II (double NTC).

Caution:

After testing, re-establish the original condition.

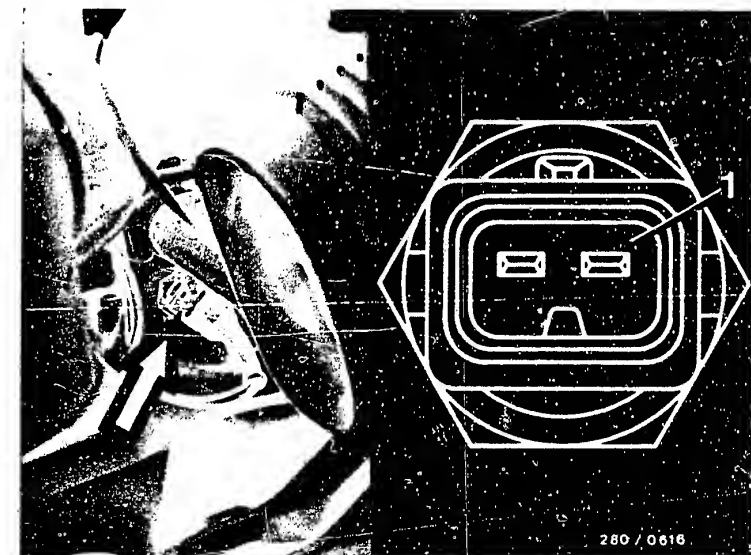
yes

Continued on M17/M18



- 1=Connector of injection valve lead
- 2=Test lead 1 684 463 093
- 3=Injection valve
- 4=Multimeter/motortester
- 5=From injection relay term. 87
- 6=From control unit term. 12

Arrow=Temperature sensor II (engine)
Top view of plug (1)



M15

Idle Speed and CO Adjustment
BMW Motorcycle K 100



M16

Idle Speed and CO Adjustment
BMW Motorcycle K 100



Idle Speed and CO Concentration Too Low or Too High (continued)

- Leak-test on Injection Valves
- Removing the fuel distribution pipe:
Loosen fastening screws. Pull all 4 injection valves simultaneously and carefully out of the cylinder head.

Build up the fuel pressure:

Jump the safety circuit.

Caution:

Make sure that no fuel gets onto hot parts of the engine.

Test Specification:

Within 60 sec. no drop may fall from the mouth of the injection valve. If incorrect, replace injection valve.

Disconnect electrical connection. Carefully slide holding clamp out of groove and pull injection valve out of fuel-distribution pipe.

Caution: Catch any escaping fuel. Do not allow to drip onto hot parts of the engine.

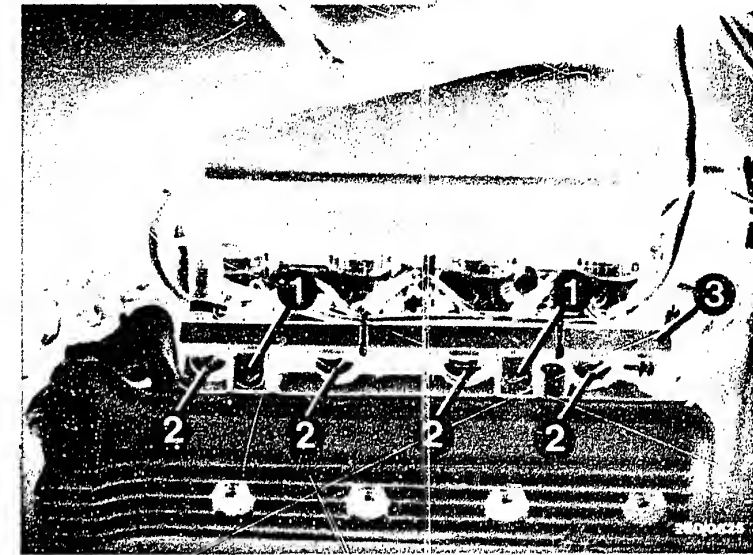
Warning:

Before installing, grease both O-rings only lightly (silicone grease F T 2 v 1). The other parts of the injection valves must remain grease-free.

Caution: After testing, re-establish the original condition.

yes

Continued on M19/M20



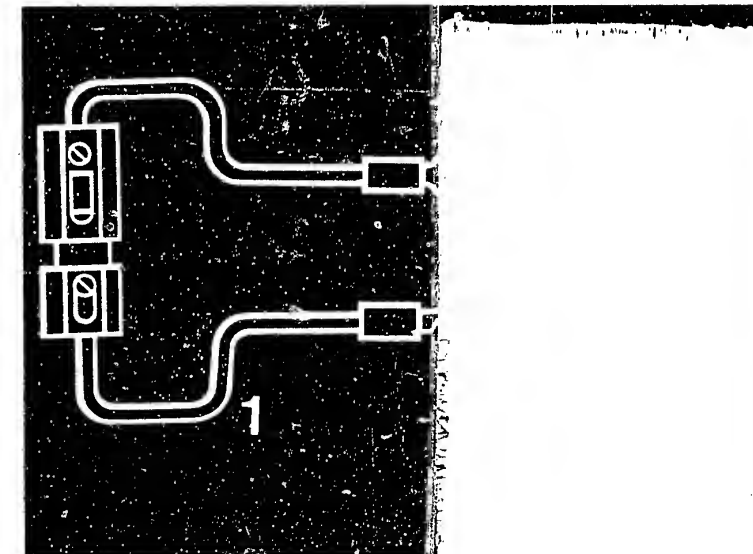
1=Fastening screws

2=Injection valve

3=Fuel-distribution pipe

1=Jumper with fuse holder and
10 A fuse (user-fabricated)

2=Top view of connection base



M17

Idle Speed and CO Adjustment
BMW Motorcycle K 100



M18

Idle Speed and CO Adjustment
BMW Motorcycle K 100



Idle Speed and CO Concentration Too Low or Too High (continued)

yes

CO reading greater than
1.5 vol. %?

Air-intake system checked for
leaks?

All hose lines correctly
connected, not kinked or
damaged? Visual examination.

Air-intake system checked for
leaks with 0.3 bar gauge
pressure?

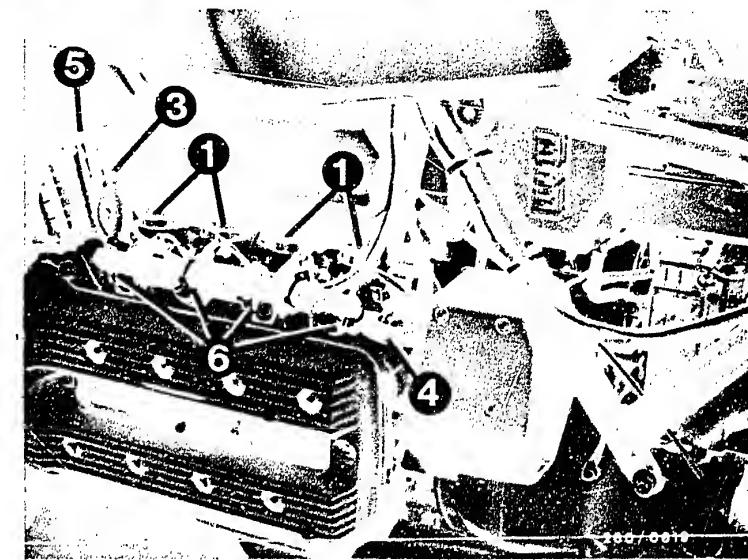
no

- Check whether hoses of air-intake system and of fuel line system are correctly connected, not kinked or damaged. If necessary, replace hoses. Remedy leaks by means of new seals or by re-tightening the connecting screws.

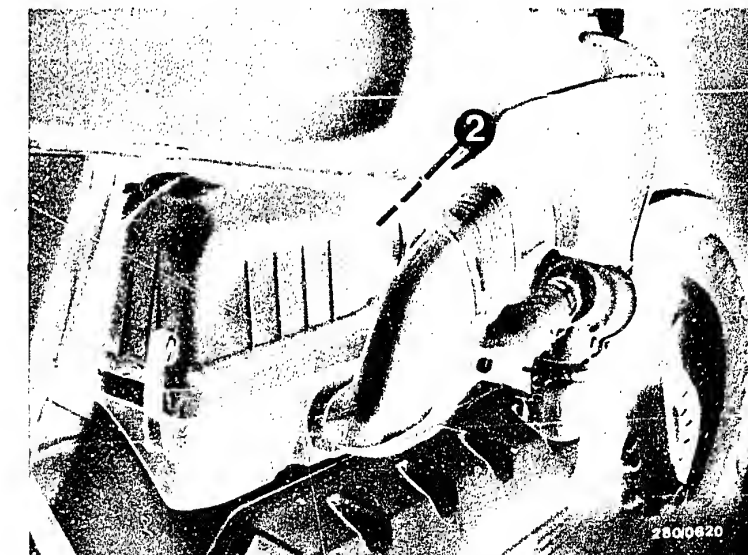
- Leak Test:
Seal off exhaust tail pipe.
Disconnect air guide to air filter. Unscrew hose between air-flow sensor and intake manifold at air-flow sensor and seal off with a disc (user-fabricated). The disc should have a hole through which air (0.3 bar) can be blown in. Open throttle valve fully. Brush or spray all joints with soapy water. Leaks may also occur due to a defective cap seal on the oil filler neck etc.
Bubbling or foaming indicates a leak.
Caution: After testing, re-establish the original condition.

yes

Continued on M21/M22



- 1=Throttle-valve assembly
2=Hose between air-flow sensor
and intake manifold
3=Hose between fuel tank and
fuel-distribution pipe
4=Hose from fuel-distribution
pipe to pressure regulator
5=Hose between pressure regulator
and fuel tank
6=Injection valves



M19

Idle Speed and CO Adjustment
BMW Motorcycle K 100

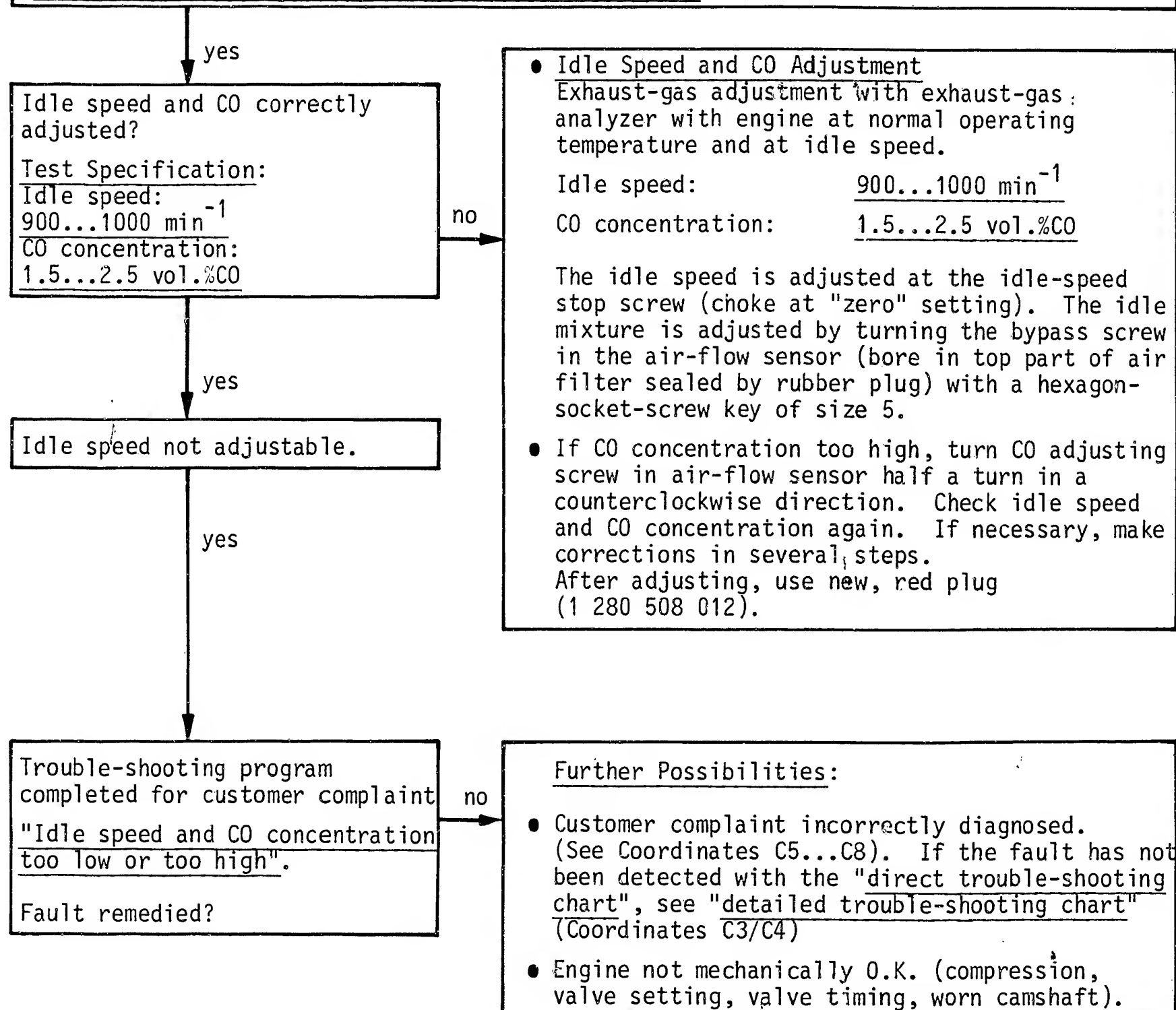


M20

Idle Speed and CO Adjustment
BMW Motorcycle K 100

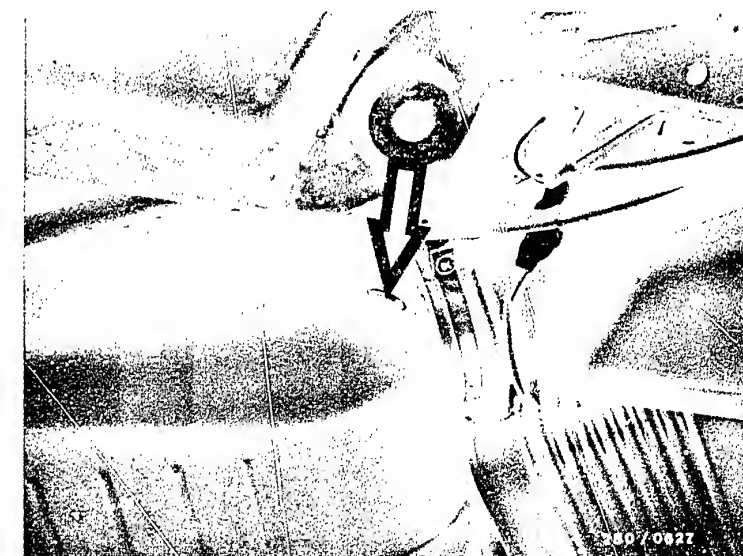


Idle Speed and CO Concentration Too Low or Too High (continued)



Arrow=Idle-speed adjusting screw

Arrow=CO adjusting screw



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Danger of Accident on Semi-conductor Ignition Systems

VDT-I-227/102 B

11.1976

Please be sure to pass this bulletin on to your employees for their attention.

The increased demands made on their ignition systems by modern engines, and the wish for freedom from maintenance, led some time ago to manufactures starting to equip their vehicles with semi-conductor ignition systems as original equipment. In most cases the performance of nearly all makes of such systems is higher than that of conventional systems, and further improvements are to be expected. This means that semi-conductor ignition systems have reached the point where contact with "live" parts or contacts (whether on the primary side or the secondary side) can prove fatal.

In this connection we should like to point out to you that the laws valid in your country regarding work on high-voltage systems must be adhered to when working on, or testing, semi-conductor ignition systems.

As a matter of principle, when working on such ignition systems the ignition is to be switched off. Included in such work are the following operations:

- Connection of engine testing equipment (timing light, dwell-toch tester, ignition oscilloscope etc.).
- Replacement of ignition system parts (spark plugs, ignition coil, ignition distributor, H.T. ignition cables etc.).

If it is necessary to switch on the ignition in order to test the system or make adjustments on the engine (to the carburetor for instance), then lethal voltages are present throughout the entire system.

This means that the danger of accident exists not only of individual components in the system (e.g. ignition distributor, ignition coil, trigger box, ignition harness), but also of the wiring harness (e.g. connection for the tachometer, diagnostic connector), on terminals, and on test equipment.

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BMW Motorcycle K 100

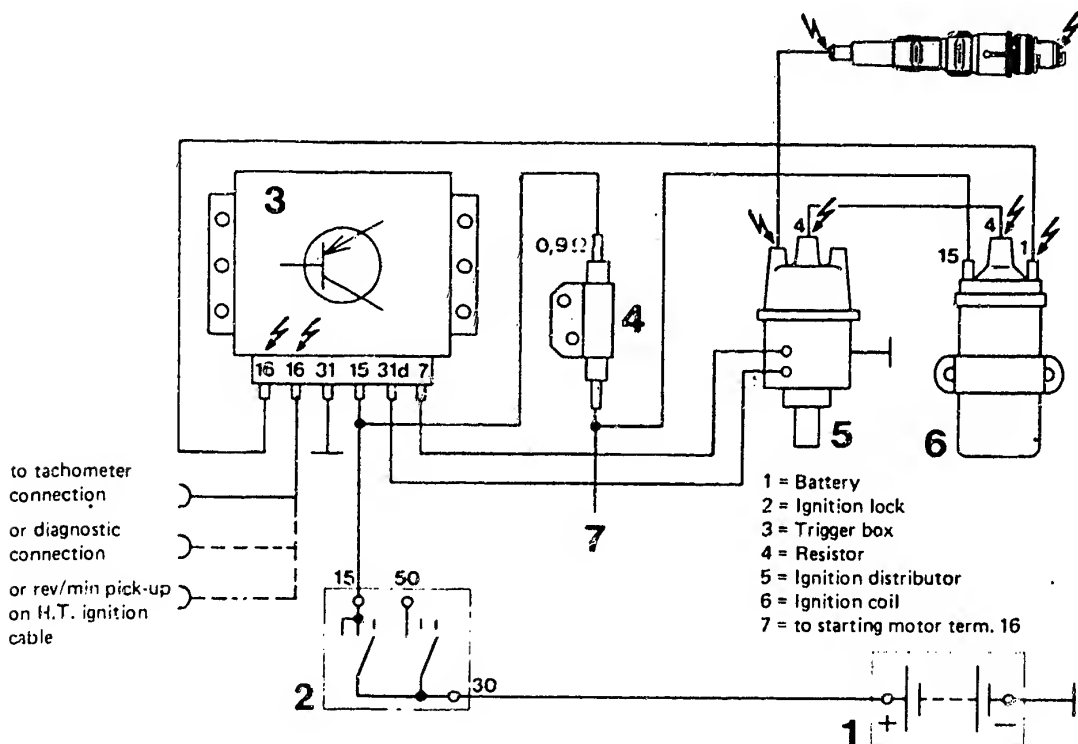


In addition, in the case of the capacitor-discharge ignition system (CDi), danger of accident is also present under the following circumstances:

- Operation of the trigger box without the ignition transformer.
- At the trigger box, (removed), relatively soon after it has been switched off (capacitor discharge).

Below is a typical terminal diagram of a semi-conductor ignition system, the danger points are marked with red high-voltage arrows. We would point out that all semi-conductor ignition systems, even the older ones, are to be regarded as dangerous in the sense as defined by this bulletin.

Please address any queries or comments concerning the contents of this publication to our representative in your country.



Terminal diagram



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EFFECTS OF ELECTRICAL AND ELECTRONIC
SYSTEMS ON HEART PACEMAKERS

VDT-I-227/107 En
1.1981

e.g. ignition systems, Jetronic, Motronic, ABS

Please ensure without fail that this Bulletin is passed on to your employees for their attention!

We have often been asked by some of our customers whether or not patients with heart pacemakers are endangered in any way by ignition systems. This theme was recently the subject of an examination carried out by the Ignition System Development Department of Robert Bosch GmbH in conjunction with Dr. Thull, lecturer at the Central Institute for Biomedical Technology at the University of Erlangen-Nürnberg and Biotronic GmbH & Co. of Berlin, a manufacturer of heart pacemakers. The magazine "Biomedizinischen Technik" (5/80) listed the results.

The most important discoveries in this practice can be summarized from the examination report as follows:-

1. Heart pacemakers corresponding to the latest state of the art are not affected by radiation (electromagnetic fields) from ignition systems.
2. With a stationary engine and the ignition switched off the heart pacemaker is not affected by any part of the ignition system, even when unintentionally touched. Maintenance work in the engine compartment, for example, can then be carried out without any danger.
3. With the engine running or stationary with the ignition switched on, touching current-carrying parts of the ignition system, as well as parts of any other electrical system, presents a certain danger for everybody. The heart pacemaker can here be affected under certain conditions (voltage, current and frequency).
Patients with heart pacemakers should therefore at all costs avoid touching current-carrying parts of electrical systems.
4. Furthermore, patients with heart pacemakers are more inclined to psychic shock effects than other people, even when they receive just a harmless electric shock, because many such patients are conscious of the increased danger to the cardiac activity.

We therefore consider it inadvisable for patients with heart pacemakers to be employed in workshops or on vehicles where ignition systems are being tested or repaired. If any members of your staff have heart pacemakers please carry out the necessary measures.

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We would like to add that heart pacemakers are not expected to be affected in any way by interference from other electronic products and systems which we manufacture, such as the Antiskid System (ABS), Jetronic, Motronic, because the much greater radiation intensity of the ignition systems examined in normal use has not caused any interference to heart pacemakers corresponding to the latest state of the art.

If you should receive questions on this matter from customers, please inform them accordingly.



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DETERMINATION OF THE TEMPERATURE VALUES
GIVEN IN L-JETRONIC MANUALS

VDT-I-280/108 En
5.1982

We have recently been asked with increasing regularity how accurately the engine temperature must be measured when trouble-shooting on the vehicle.

So far in its L-Jetronic manuals KH/VSK has given three or four different temperatures for testing the temperature sensor:

-10 °C, +20 °C, +40 °C and +80 °C,

and two ranges for the thermo-time switch e.g. 35 °C 8 sec.

below +30 °C and above +40 °C.

Since the temperature range need not be subject to such close tolerances, we propose in future the following more appropriate definition:

- Ambient temperature (approx. +15 °C to +30 °C)
- Engine at normal operating temperature (approx. +80 °C).

Please direct questions and comments concerning the contents to our authorized representative in your country.

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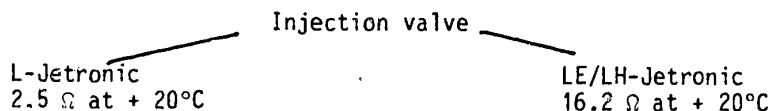
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CODING OF LE/LH-JETRONIC
SOLENOID-OPERATED INJECTION VALVES

VDT-I-280/109 En
5.1982

With the introduction of the LE/LH-Jetronic the internal resistance of the solenoid-operated injection valves has also been changed.



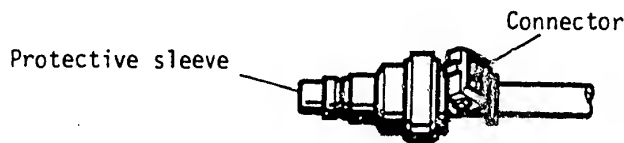
The connector has been left the same for cost reasons and to meet customer wishes.

Caution!

If L-Jetronic injection valves are installed in an LE/LH-Jetronic vehicle, either the control unit or the injection valves will suffer irreparable damage.

Note:

- Install only injection valves with the part number designated for the vehicle.
- As a guide, injection valves with 16.2 Ω internal resistance have a yellow protective sleeve.



- A colour coding (yellow) of the connector (see also VDT-I-280/5) is not generally intended for LE/LH-Jetronic injection valves.

Please direct questions and comments concerning the contents to our authorized representative in your country.

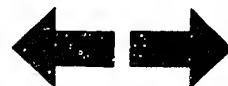
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VDT-I-280/110 En

6.1983

PARTS SET FOR INJECTION VALVES

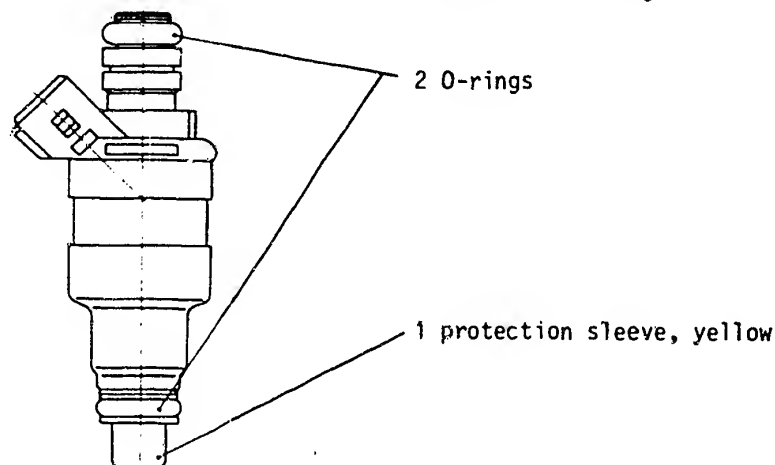
Supersedes 6.1982 edition

0 280 150 2..

AND PRESSURE REGULATORS 0 280 160 2..

A common parts set is available for the L-Jetronic/LE-Jetronic solenoid-operated injection valves and pressure regulators with the new method of connection.

Contents for 1 injection valve:



Contents for 1 pressure regulator:
1 O-ring
1 supporting plate

Since the above-mentioned parts are subjected to extreme temperature stress, they should be exchanged for new parts whenever servicing is carried out.

"Unmetered air" sucked in through injection-valve seals which are not tight, is a frequent case for servicing.

The parts set has the part number 1 287 010 704 and will in future be listed in the service parts microfiche under solenoid-operated injection valves (see EE 00 under 0 280..).

Please direct questions and comments concerning the contents to our authorized representative in your country.

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PLUG CONNECTORS FOR
JETRONIC COMPONENTS
Parts sets

VDT-I-280/111 En

11.1984

(supersedes edition 11.1982)

Parts sets are available for replacement of Jetronic plug connectors. These consist of:

- Plug connector housing
- Protective cap (rubber sleeve)
- Contact springs

These parts are listed on microfiche EE...*.

* see microfiche EE00 under 0 280 ..

- Plug, black, 2-pin,
parts set 1 287 013 002 cable connector in conjunction with socket, 2-pin
- Socket, black, 2-pin,
parts set 1 287 013 001 for e.g.

| | |
|----------------------|---------------|
| Temperature sensor | 0 280 130 0.. |
| Auxiliary-air device | 0 280 140 .. |
| Thermo-time switch | 0 280 130 2.. |
| Start valve | 0 280 170 .. |
| Warm-up regulator | 0 438 140 .. |

- Socket, grey, 2-pin
parts set 1 287 013 003 for:

| | |
|--------------------------------------|--------------|
| Solenoid-operated injection valve | 0 280 150 .. |
|--------------------------------------|--------------|

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Technical Bulletin
BMW Motorcycle K 100



- Socket, black, 3-pin,
parts set 1 237 000 039 for:
Throttle-valve switch 0 280 120 ..
- Socket, black, 5-pin,
parts set 1 287 013 006 for:
Air-flow sensor 0 280 20. ..
(LE version)
- Socket, black, 6-pin,
parts set 1 287 013 004 for
Air-flow sensor 0 280 200 ..
- Socket, black, 7-pin,
parts set 1 287 013 005 for:
Air-flow sensor 0 280 20. ..
Air-mass sensor 0 280 211 ..
- Wiring-harness plug connector, black, 25-pin
parts set 1 287 013 009 for:
Control unit 0 280 0..
- Wiring-harness plug connector, black, 35-pin,
parts set 1 287 013 008 for:
Control unit 0 280 0..

The contact springs (minitimers) are also available separately under part no. 1 284 477 026.

The plug-connector housings are only available in the stated colours.

Responsible:

Robert Bosch GmbH

Division KH

Technical After-Sales Service (KH/VKD 2)

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After-sales Service

Motor Vehicle Service Information

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UNIVERSAL TEST ADAPTER

VDT-I-Gen. 1001 En

1.1982

1. Application

The multiplicity of different fuel-injection and ignition systems at present available on the market, as well as the advances in development which can be expected in the future, demand a new testing concept. In order to maintain the outlay for test equipment, and hence the costs, at a reasonable limit we have developed the universal test adapter.

The following systems can be tested using a test-adapter universal unit together with adapter leads suited to the system in question:

1.1 Systems which are already being fitted as series:

- L-Jetronic (1st generation)
- LE-Jetronic (2nd-generation L-Jetronic)
- Motronic (with the new connector designation, refer to the vehicle-specific instructions!)

1.2 Systems whose introduction is planned:

- Motronic with gearbox control
- KE-Jetronic
- Mono-Jetronic
- Electronic ignition system with ignition map (EZF)

2. Delivery dates and Part Numbers

Available as from 2.1982.

2.1 Universal test adapter (basic unit)

Part Number: 0 684 101 801

Designation: ETT 018.01

2.2 System adapter lead for LE-Jetronic (2nd-generation L-Jetronic)

Part Number 1 684 463 123

First application: For BMW 2.5/2.8 l engines as from 9.1981, and for Opel 2.0 l engines (Manta/Rekord) as from 9.1981.

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Motor Vehicle Service Information

BMW Motorcycle K 100



2.3 System adapter lead for Motronic with new connector assignment.

(Refer to the vehicle-related instructions!)

Part Number : 1 684 463 024

First application: Porsche 944 as from series production, BMW as from about 3.1982 (Europe)

2.4 System adapter lead for L-Jetronic (in preparation)

Further system adapter leads will be made available along with the introduction of the new systems as mentioned above.

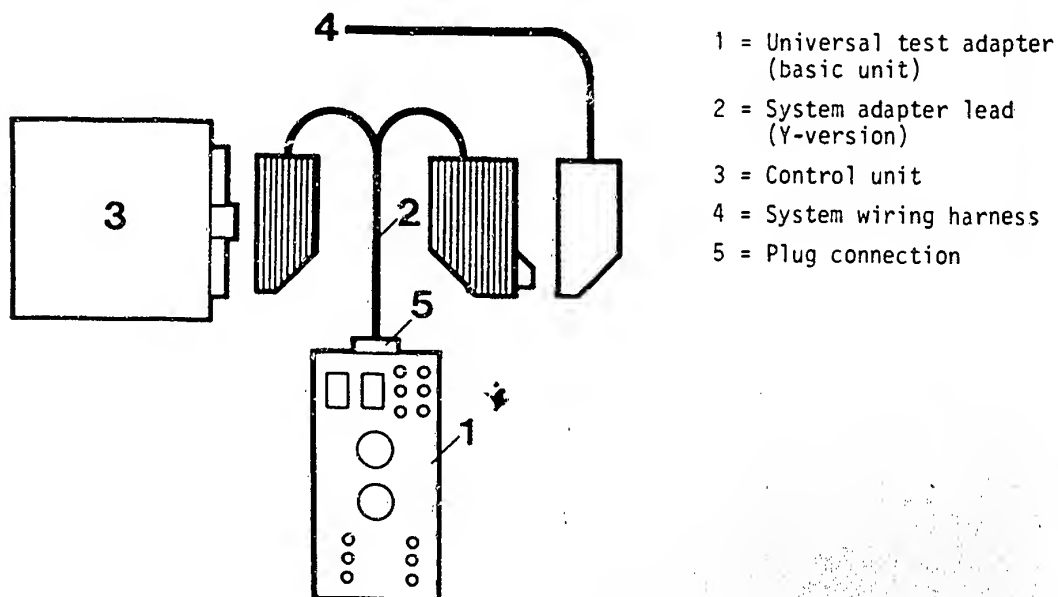
3. Testing procedure

The systems and the components are tested for voltage and resistance values as well as for correct functioning. Evaluation is by means of a multimeter and the Motortester which are connected into the universal test adapter.

Depending upon the complexity of the system, interchangeable adapter lead model 1 or model 2 is provided:

3.1 Adapter lead for peripheral and function testing (Model 1)

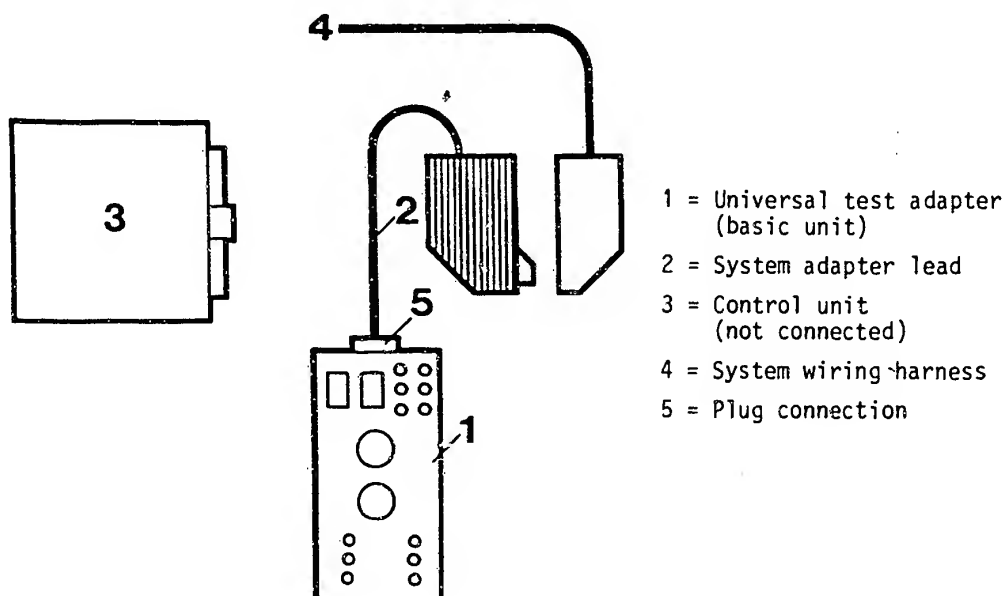
The universal test adapter together with the system adapter lead is to be connected to the system wiring harness and to the control unit (e.g. Motronic).
To be tested: Wiring harness with components and control unit.



3.2 Adapter lead for peripheral testing (Model 2)

The universal test adapter with system adapter lead, is only to be connected to the system wiring harness (e.g. LE-Jetronic (2nd-generation L-Jetronic)).

To be tested: Wiring harness with components (without control unit).

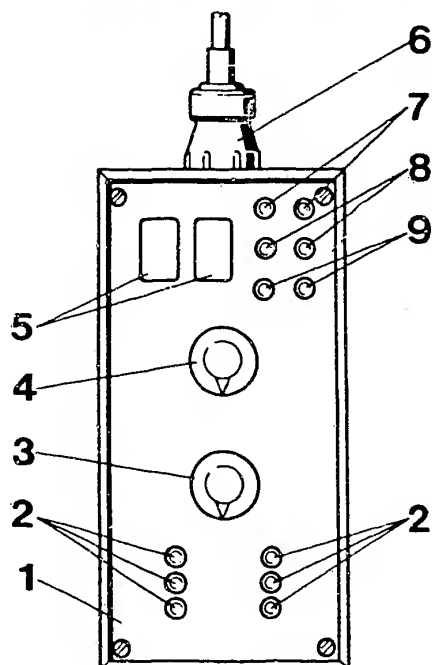


4. Construction of the universal test adapters

The universal test adapter is fitted with 2 program switches, voltage and resistance measurement. The measured values are displayed on the multimeter connected to the universal test adapter. For reasons of safety, the voltage and resistance sockets are separated. In order to measure signals (e.g. injection pulses, ignition pulses), it is necessary to connect a Motortester to the measuring cavities (special input).

When carrying out functional tests with the control unit connected, selected push-buttons are pressed in a number of test-program steps in order to simulate a variety of different engine operating conditions the influence of which is evaluated using the Motortester.





- 1 = Universal test adapter (basic unit)
- 2 = Keyboard for simulation of various conditions e.g. engine temperature, throttle position etc.
- 3 = Program switch "Ohm" for resistance measurement
- 4 = Program switch "Volt" for voltage measurement
- 5 = Measurement "cavities" (for the special input from the Motortester)
- 6 = 63-pole plug-in connection for connecting the system adapter lead
- 7 = Measurement sockets (voltage measurement with a multimeter or with the Motortester)
- 8 = Measurement sockets (resistance measurement with the multimeter)
- 9 = Sockets for special functions (not yet allocated)

Notes:

1. The Motronic test adapter (0 684 101 800, ETT 018.00) will continue to be used for Motronic-equipped BMW vehicles (with old connector assignment) up to about year of manufacture 3.1982 (refer to vehicle-specific instructions).
2. Details on the operation of the universal test adapter, and the test specs, are to be found in the vehicle-specific after-sales service instructions.

3. Caution! Change of Part Number:

On the SIS-microfiches OPE-00/J22 (Coordinates A14 and A17) the new Part Numbers are as follows:

Universal test adapter: 0 684 101 801

Adapter lead : 1 684 463 123



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When direct trouble-shooting a specific LE-2 version component, it is absolutely essential to look up the respective test step under the customer complaint.

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TROUBLE-SHOOTING PROGRAM ACCORDING TO CUSTOMER
COMPLAINTS

Coordinates

STARTING MOTOR OPERATES, ENGINE FAILS TO
START OR STARTS ONLY WITH GREAT DIFFICULTY

F 1 - F 16

↑
Cold-start Control (Testing)

4 F 3 - F 10

Air-flow Sensor

F 11 - F 14

Hose Lines, Electrical Lead Connections
and Leak Test

F 13 - F 14

ENGINE STARTS BUT THEN DIES

F 17 - G 4

Throttle-valve Adjustment

F 19 - F 22

Injection valves (Leak Test)

F 23 - F 24

Leak Test on Hose Lines

G 1 - G 2



SectionCoordinatesROUGH IDLE/INCORRECT IDLE SPEED

G 5 - G 22

Throttle valve

G 7 - G 8

Throttle-valve Adjustment

G 7 - G 8

CO and Idle Adjustment

G 9 - G 10

Functional Test of Injection Valves

G 11 - G 12

Mechanical Test of Injection Valves

G 13 - G 14

Air-flow Sensor

G 15 - G 18

Hose Lines and Leak Test

G 17 - G 18

CO and Idle Adjustment (Repeat)

G 19 - G 20

POOR THROTTLE TAKE-UP

H 1 - H 16

Throttle-valve Adjustment

H 3 - H 4

Pressure difference between intake ports,
synchronizing the throttle valves

H 3 - H 4

Air-flow Sensor (Noise Test)

H 5 - H 10

Leak Test on Hose Lines

H 11 - H 12

CO and Idle Adjustment

H 13 - H 14

